Many thanks to our main sponsor:
Contents

Welcome Page 2
Message from the Dean Page 3
INTRA – The DCU-Industry Work Placement Programme Page 4
Employing Graduates from the Faculty of Engineering and Computing Page 5
The School of Computing Page 6
The School of Electronic Engineering Page 7
The School of Mechanical and Manufacturing Engineering Page 10
Message from Our Sponsor Page 12

Project Numbers/Areas Page 15

Project Listing Page 17
Lab Locations for Projects [LG – ground floor L1 – first floor] Page 27
Project Numbers and Locations Page 28

Individual Projects: No. 1-221 Page 35

Sponsors of Prizes Page 110
Welcome

Welcome to the Final Year Projects exhibition by the graduating B.Sc. and B.Eng. classes of 2018 from the DCU Faculty of Engineering and Computing.

Our details and respective projects can be found within this booklet. The projects demonstrate how we put into practice the knowledge gained during our time here in DCU. They cover many areas within computing, electronic engineering and mechanical and manufacturing engineering and are inspired by time spent on INTRA (work placement), staff research interests, collaboration with companies and original concepts. The projects clearly demonstrate our hard work and innovation.

We would like to extend our thanks to lecturers, supervisors and the support staff for all their help and assistance throughout our time here. Without their support we would not be here today. We would also like to thank the main sponsor of this event, SAP and those companies sponsoring prizes. Through their sponsorship they are showing a belief in the ability of Irish graduates and a commitment to the future of Irish industry.

And last, but not least, we thank you, the visitors and the companies you represent, for showing an interest in our work – we hope you enjoy it!

Faculty of Engineering and Computing
Final year students 2018
Message from the Dean

On behalf of the Faculty of Engineering and Computing, I would like to welcome you all to this year’s Final Year Projects exhibition by the Class of 2018. This event started as a single School of Computing event three decades ago and has grown from 25 projects back in the late 1980s to 221 exhibitors at the present day.

Today, we have the opportunity to recognise and celebrate the work of these students. We all go through many stages in our careers and lives, and today, for these students, marks an important milestone. Today, they display this major highlight of their academic achievements for their peers, their academic mentors, and for the many guests who join us from industry and the wider DCU community.

At its core, our Faculty’s focus is to release the potential which our students have, to have impact. We believe that the range of Final Year Projects on display here today reflects the great opportunities for these young graduates to contribute to the advancement of Irish society over coming years. Many of the projects displayed represent products with immediate commercial potential; all demonstrate ingenuity, skill and technical capability of the highest calibre.

To the students, congratulations and well done! Some of you will now go on to careers within the engineering, computing or other sectors of the Irish economy; others will continue your formal education either here in DCU or elsewhere; some may travel across the world; and some may choose to develop your careers into new and different directions – management, accounting, consultancy, maybe even politics! But we hope that all of you will look back with fondness at your time here at DCU, and also – and perhaps more importantly – at the friendships you have made here. We here in the Faculty always enjoy hearing how former students are developing in their careers. Do please stay in touch, and come back and visit from time to time – you will always be welcome!

To our guests, thank you for taking the time to join us here today. We hope that you enjoy your visit and are impressed with the depth and breadth of the work that our students are presenting. Impressive though they are, these projects still represent only a small sample of the learning that the students have achieved in the course of their studies. Do please engage with them directly and explore more fully what the DCU education experience represents.

DCU is well-known for its strong relationship with enterprise, innovation and entrepreneurship. We are confident that the students you meet here today will go on to have a strong impact on the various industries and sectors that you represent.

The staff and students of the Faculty look forward to meeting you and sharing these projects with you, and we hope you all enjoy your visit to the Faculty and DCU.

Prof. Lisa Looney
Dean, Faculty of Engineering and Computing
INTRA – The DCU-Industry Work Placement Programme

Relevant work experience through DCU’s INTRA (INtegrated TRAining) programme has been a central feature of education at DCU since the establishment of the university, and is an integral part of all undergraduate degree programmes in the Faculty of Engineering and Computing. Under the INTRA programme, undergraduate students complete a six month work placement during their third year of study, running from April to September inclusive. In many cases, students are subsequently recruited to work with their INTRA employers after they have completed their undergraduate studies.

Why Offer an INTRA Placement?

Every year, employers in Ireland and overseas hire more than 800 students from DCU for an INTRA placement. Ranging in size from the largest multinational, to the sole trader or startup, these employers are convinced of the merits of choosing DCU students and come back to INTRA year after year. INTRA provides the following opportunities for an employer:

- Access to a supply of highly motivated young people who have proven that they can make a real contribution
- An opportunity to evaluate and train possible future employees
- Frees existing staff from time-consuming but routine tasks
- Allows relief or assistance during seasonal peak work loads
- Permits new projects to be undertaken
- Develops existing staff by providing mentoring opportunities
- Raises awareness of your company and products/services on campus
- Provides an ideal opportunity for employers and academics to establish long-term relationships and the potential for working together on projects
- Provides an opportunity for involvement in the development of graduates with the required key skills essential to the Irish economy
- Helps to promote and reinforce a lifelong learning culture within an organisation through the establishment of strong links with a third level institution

For more details, contact Maeve Long, Head of INTRA, phone: +353 (01) 700 5515, email: maeve.long@dcu.ie
Employing Graduates from the Faculty of Engineering and Computing

DCU’s Careers Service offers a comprehensive employment service for companies wishing to recruit graduates from our Engineering and Computing programmes as well as providing a crucial link to students from a range of other disciplines including Business, Humanities, Science and Education.

As an employer, you have the opportunity to reach excellent DCU students and graduates through availing of the following:

- Advertising vacancies online, which are seen by up to 1,000 students and graduates per week. Check out: [www.dcu.ie/careers](http://www.dcu.ie/careers)
- Participating in an annual Employer Recruitment Fair, which allows companies to meet up to 2,000 talented DCU students and graduates in October every year as well as students from a range of other Irish Universities and Third Level Colleges
- Visiting Employer Programme: To recruit competent, highly-educated DCU students and graduates from relevant courses, you may wish to make presentations on campus or even conduct interviews here. The Careers Service runs a Visiting Employers Program and provides opportunities for companies to come on campus and advertise their vacancies and meet plenty of enthusiastic DCU students
- Opportunity to advertise your vacancies to a range of DCU Alumni in conjunction with DCU Careers Service and DCU Alumni
- Raise your company profile on campus: DCU Careers Service can email company information on vacancies of relevance to DCU students and graduates directly into the mail accounts of the appropriate students

To learn more about how DCU Careers Service can assist you in recruiting high calibre graduates, visit [www.dcu.ie/careers](http://www.dcu.ie/careers) or contact Ms. Miriam Jones, Employer Engagement & Operations Officer, email: [Miriam.jones@dcu.ie](mailto:Miriam.jones@dcu.ie), phone: +353 (01) 700 5129.

Collaboration on Undergraduate Projects

An interesting way in which companies can raise their profile among graduating students is by putting forward projects which students can work on as part of their course. Companies are also invited to provide in-house support for projects undertaken by students, or to provide financial support for projects assigned to students. There are several benefits to the company, not least of which is the opportunity to get valuable research undertaken that might not be possible within the company due to operational commitments.

If you are interested in finding out more about possible collaboration with students in our Schools here are the contact details:

School of Computing
phone: +353 (01) 700 8980  email: [computing.info@dcu.ie](mailto:computing.info@dcu.ie)

School of Electronic Engineering
phone: +353 (01) 700 5131  email: [ee.info@dcu.ie](mailto:ee.info@dcu.ie)

School of Mechanical and Manufacturing Engineering
phone: +353 (01) 700 5104  email: [mme.info@dcu.ie](mailto:mme.info@dcu.ie)
The School of Computing

The School of Computing at Dublin City University has earned a strong reputation for excellence in research and teaching. In addition to its existing programmes the B.Sc. in Computer Applications degree and the B.Sc. in Enterprise Computing. The new and innovative B.Sc. in Data Science [datascience.dcu.ie](http://datascience.dcu.ie) is the first of its kind in Ireland, and is aimed at students who are interested in a career in Big Data, data analytics and related data science roles. We also offer a range of innovative taught programmes aimed at producing graduates with the professional and personal skills most sought after in the Information Economy.

The School also enjoys a lively, supportive environment for research in many areas of computing, with its numerous Ph.D. and M.Sc. research students producing work of significance at both national and international level. With close industry links and fee support for EU students, the School’s teaching and research programmes reflect the current and anticipated needs of Ireland’s industrial and commercial sectors while at the same time meeting the most rigorous national and international academic standards.

The range of undergraduate and postgraduate programmes are:

- B.Sc. in Data Science
- B.Sc. in Enterprise Computing
- B.Sc. in Computer Applications
- M.Sc. in Computing (with a major)
- M.Sc. in Computing (Data Analytics)
- M.Sc. in Computing (Security and Forensic Computing)
- M.Sc. in Computing (Cloud Computing)
- M.Sc. in Computing (Software Engineering)
- M.Sc. in Electronic Commerce
The School of Electronic Engineering

Student Knowledge and Aptitudes

The objective of our taught BEng/MEng programmes in Electronic and Computer Engineering is to produce qualified engineering professionals who will:

- Have a sufficient understanding of basic sciences and mathematics appropriate to developing their careers as professional engineers
- Be competent in electronic circuits, systems and software design
- Have a detailed knowledge of the most important sub-disciplines related to their programme of study
- Have a capacity to model and analyse the dynamics of a range of technological systems
- Understand the overall requirements of product design
- Understand the structure and organisation of industry and have relevant industrial experience as a support to attaining the previous objectives
- Be capable of approaching problem-solving in a creative and innovative way
- Have developed a range of communication skills – oral, written and visual
- Have sufficient personal and inter-personal skills to enable them to be effective contributors to technology-based industrial development
- Be critically aware of the impact of engineering on society
- Embody the professional qualities of discipline, discrimination and application
- Be aware of the need to update or deepen their knowledge and skills and have an ability to do so through research, academic or professional training

Work Areas

Students from our taught BEng/MEng Engineering programmes have the ability to work in a range of different engineering areas, some of which are listed below.

BEng in Electronic and Computer Engineering

- Majors offered in Systems and Devices, High-Speed Communications, Digital Interaction, and the Internet of Things (IoT)
- Building on successes of previously offered BEng programmes in Electronic Engineering, Information and Communications Engineering, Digital Media Engineering
- Hardware design and development of embedded systems
- Development of optical communications systems
- Semiconductor and nanoelectronic materials and device manufacturing
- ASIC design/testing
- Building real-time distributed system infrastructure and applications software
- Development of computer and machine vision solutions
- Analysis, development, refinement and optimisation of DSP algorithms
- Network design and operation for public telecom operators
- Private network design and operation for utility companies, government organisations and/or financial services applications
- System design, concentrating on hardware, software or both
- Technical marketing, including network design
- Telecommunications research organisations and consultancies
- Telecommunications software development
- Systems development for diverse database-backed web services
- Hardware design of digital media devices (incl. mobile phones, tablets, mobile robotics)
- Development of virtual reality, telepresence and visualisation applications
- Web applications and interfaces for delivery of content to diverse environments
- Systems architecture design for e-commerce/B2B applications
- Developing archival or browsing systems for libraries of multimedia content

**BEng in Mechatronic Engineering (jointly in collaboration with the School of Mechanical and Manufacturing Engineering)**

- An understanding of the principles of fundamental sciences, engineering sciences, technology and mathematics
- An understanding that a few powerful unifying principles govern the function of many different mechatronic systems
- A thorough knowledge of modelling and design, system integration, actuators and sensors, intelligent systems, robotics, computer integrated manufacturing and automation, motion control and image processing
- A capacity to take a problem and redefine it in an engineering context; in the course of designing a system, component or process to meet specified needs
- Proficiency in the design and running of experiments and the analysis and interpretation of data
- A knowledge of the resources required to put in place a solution to an engineering problem taking into account the practical constraints from a technical, human resources and financial perspective
- The capability of efficient project management maximising use of available resources to produce a successful outcome in a pre-defined time frame
- An ability to demonstrate professional conduct in diverse, complex and unfamiliar situations at all times being aware of the implications of their work
- An understanding of the need for high ethical standards in the practice of engineering, including the responsibilities of the engineering profession towards people and the environment
- An understanding that sustainability, recycling and product life cycle must be considered at the design stage
- An ability to work as part of a multidisciplinary team using their hybrid mechatronic training to integrate technologies in a synergistic manner
An awareness of the need to update or deepen their knowledge/skill set and an ability to conduct further training through research, academic or professional training

An ability to independently acquire further expertise and to ensure that the use of this expertise complies with the ethical standards of the profession

An understanding of the importance of the engineer’s role in society and the need to communicate effectively within this environment and to other engineers

An ability to embrace all modern media for the purposes of communication, with a strong emphasis on visual computer aided design methods

An understanding of the need for the highest ethical standards of practice

An understanding that, as part of a team, it is important to consider the opinions of other members and to put in place a plan/design/process that is cognisant of these opinions

Full details of the DCU INTRA programme are available at: www.dcu.ie/intra.

Taught MEng in Electronic and Computer Engineering

- Major in Nanotechnology
- Major in Advanced Data Networks
- Major in Internet of Things
- Major in Image Processing and Analysis

Taught MEng in Digital Health and Medical Technologies

- 3U Joint Programme with Maynooth University and Royal College of Surgeons in Ireland
- Graduates can expect to work both inside and outside the health services
- Software and engineering of healthcare focussed services and systems
- Technology-based products for use in a medical/clinical environment
The School of Mechanical and Manufacturing Engineering

Student Knowledge and Aptitudes

The objective of our taught BEng/MEng programmes in Mechanical and Manufacturing Engineering disciplines is to produce qualified engineering professionals who will:

- Have a sufficient understanding of basic sciences and mathematics appropriate to developing their careers as professional engineers
- Be competent in design, professional development, dynamics and control, solid mechanics, fluid mechanics, materials and manufacturing, sustainable manufacturing systems, biomedical engineering and business (depending on their discipline)
- Have a detailed knowledge of the most important sub-disciplines related to their programme of study
- Have a capacity to model and analyse the dynamics of a range of technological systems
- Understand the overall requirements of product design
- Understand the structure and organisation of industry and have relevant industrial experience as a support to attaining the previous objectives
- Be capable of approaching problem-solving in a creative and innovative way
- Have developed a range of communication skills – oral, written and visual
- Have sufficient personal and inter-personal skills to enable them to be effective contributors to technology-based industrial development
- Be critically aware of the impact of engineering on society
- Embody the professional qualities of discipline, discrimination and application
- Be aware of the need to update or deepen their knowledge and skills and have an ability to do so through research, academic or professional training

Work Areas

Students from our taught BEng/MEng Engineering programmes have the ability to work in a range of different engineering areas, including new emerging fields, some of which are listed below.

BEng/MEng in Mechanical and Manufacturing Engineering

- Design of engineering materials, processes and components, and related developing technologies
- Create models (CAD or otherwise), deriving appropriate equations and specifying boundary conditions and underlying assumptions and limitations
- Use of appropriate mathematical methods for application to new and ill-defined mechanical and manufacturing engineering problems
- Investigate the performance of systems and components through the use of analytical methods and modelling techniques, and develop software tools including numerical techniques to solve engineering problems
- Product design and development of mechanical systems, 3D printing and robotics
- Sustainability of manufacturing processes and renewable energy
- Project management skills and teamwork

**BEng/MEng in Biomedical Engineering**
- Modelling and design, production technology, biomaterial science and the requirements for regulatory compliance
- Understanding of anatomy, physiology, biomechanics, image processing, sensors and statistics
- Bio-engineering, tissue engineering, and applications of advanced technologies
- Development of computer-based designs to mimic and solve bio engineering problems
- Application of ethical standards and duty-of-care towards the end-users of biomedical products

**B.Sc. in Manufacturing Engineering with Business Studies**
- Design, manufacturing and marketing of engineering products
- Management of manufacturing processes and systems coupled with the awareness of business opportunities
- Synergistic approach to solving engineering challenges (designing, manufacturing, engineering products and managing manufacturing processes)
- Application of appropriate business skills (marketing, plant operation, project management and business management) within the broad discipline of manufacturing engineering

**BEng in Mechatronic Engineering** (jointly in collaboration with the School of Electronic Engineering (see page 8).
Message from Our Sponsor

SAP are delighted once again to be here to celebrate the final steps of your undergraduate journey. I would like to congratulate you for your significant achievement and wish you well on the next phase of your career.

As graduates, you are entering the industry at a very exciting time, a time of digital transformation. Software is embedded in every part of our lives. Cloud and in-memory computing have been game changers allowing companies to leverage innovative technologies and real-time data. At SAP we recognise the importance of these new technologies and are striving to offer our customers a way to harness the benefits of the digital world of today. We help our customers Run Simple backed by the strong track record of our software and support.

This operating principle is the cornerstone for our workforce of over 87,000 people worldwide, we are focused on helping the world run better. I hope that wherever your career takes you that you will push businesses to innovate- to do things simpler, faster, smarter, and more sustainably, in ways that will ultimately change the world.

I’d like to take this opportunity to highlight the SAP Ireland Cooperative Program and our Internship Program (iXp). The Cooperative Program which was launched in 2015 with DCU as a central partner. This extended professional internship offers select students the opportunity to work with SAP for 2 years in conjunction with their academic studies. This program complements their academic studies and allows them to apply their knowledge in real world situations.

Our Internship Program (iXp) is a 6-month curriculum based internship model which focuses on delivering one cohesive and enjoyable learning experience. Like the Cooperative Program, students work on meaningful projects which impact our business.

I am pleased that 14 DCU students who have gone through our Cooperative and Internship program are among you today. Many of whom will soon graduate and take up positions with us in the coming months.

A final note of congratulations on this special day and I wish you every success in the future.

Liam Ryan
MD SAP Ireland
Being part of SAP motivates me, because I have the prowess to drive the latest trends in innovative technologies

Suhan Hegde

FIND YOURSELF WORKING AT SAP.
sap.com/careers
Did You Know?
• SAP is the world’s leading provider of business applications, cloud services, analytics, mobile, and database.
• SAP’s vision is to help the world run better and improve people’s lives.
• SAP won 281 “best employer” awards in 2017 and is a globally recognized employer of choice.
• We belong to the Forbes Top 100 most reputable brands
• 91% of SAP employees are proud to work for SAP.

Our Culture and Values
International cooperation with colleagues from diverse cultural backgrounds is an everyday occurrence at SAP. A sense of community, fairness, flexibility, and enthusiasm are paramount. We operate an open-door policy in all departments and at all levels.

Career Opportunities for Students and Graduates
Working for the world’s leading provider of business software opens up a whole host of opportunities for students:

• Internships
• Working student positions
• Bachelor’s and master’s thesis
• Graduate positions

We look for motivated students and graduates who want to make an impact, preferably with a background in:

• Business studies
• Computer science
• Business information technology
• Physics
• Mathematics
• Industrial engineering

Development Opportunities
SAP supports your personal career development with:

• Competent, on-the-job support
• Career success center
• Targeted job enrichment
• Internal rotation between positions and roles
• Internal vacancies market

Employee Benefits
SAP offers flexible working time models and:

• Free leisure activities (gyms, saunas, tennis courts, sports groups, exercise classes...)
• Flexible working opportunities
• Pension plan and accident insurance
• Share-related benefits
• Time accounts

SAP Fast Facts
Revenue in 2017: €23 billion
Year founded: 1972
Headquarters: Walldorf, Germany
Employees worldwide: 88,543
43% Millennials
32% Women
Offices: In over 130 countries, providing sales, consulting, service and support

Follow Life at SAP on social media

© 2018 SAP SE or an SAP affiliate company. All rights reserved.
Faculty of Engineering and Computing Programs

Project Numbers

**Computer Applications:** [1, 3, 6, 8, 10, 11, 14, 19, 21, 24, 33, 36, 38, 41, 43, 49, 52, 53, 56, 59, 62, 64, 67, 71, 73, 76, 81, 87, 89, 93, 99, 102, 103, 106, 108, 110, 116, 118, 121, 128, 134, 136, 138, 139, 143, 145, 147, 149, 150, 152, 155, 159, 161, 168, 170, 172, 180, 184, 190, 191, 193, 195, 197, 199, 200, 202, 203, 206, 209, 211, 214]

**Enterprise Computing:** [5, 16, 26, 30, 35, 45, 55, 60, 75, 80, 86, 91, 96, 101, 112, 113, 123, 126, 130, 132, 137, 142, 148, 158, 166, 187, 196, 204]

**Computational Problem Solving and Software Development:** [65, 183, 216]

**Electronic and Computer Engineering:** [12, 20, 23, 29, 34, 39, 42, 46, 57, 70, 77, 78, 84, 95, 97, 105, 107, 111, 120, 124, 127, 140, 157, 171, 178, 186, 205, 207, 213]

**Mechatronic Engineering:** [7, 25, 28, 31, 37, 48, 50, 66, 69, 85, 94, 100, 119, 125, 133, 146, 153, 162, 164, 167, 175, 177, 181, 188, 192, 210, 212]

**Manufacturing Engineering with Business:** [2, 88, 176]

**Biomedical Engineering:** [17, 32, 47, 51, 54, 58, 74, 79, 83, 90, 98, 135, 144, 160, 163, 174, 179, 182, 194, 198, 201, 215]

**Mechanical and Manufacturing Engineering:** [4, 9, 13, 15, 18, 22, 27, 40, 44, 61, 63, 68, 72, 82, 92, 104, 109, 114, 115, 117, 122, 129, 131, 141, 151, 154, 156, 165, 169, 173, 185, 189, 208]

**Project Areas**

**3-D Modelling:** [9, 13, 15, 54, 85, 100, 115, 122, 125, 127, 161, 173, 174, 189, 201, 208, 210]

**Additive Manufacturing:** [58, 72, 85, 151, 215]

**Advanced Material Engineering:** [17, 72, 90, 109, 146, 156, 163]

**Android:** [3, 5, 8, 10, 11, 19, 21, 26, 43, 46, 53, 59, 62, 64, 73, 78, 80, 87, 93, 99, 112, 123, 130, 136, 138, 139, 143, 147, 159, 162, 180, 181, 184, 190, 196, 197, 202]

**Arduino:** [7, 11, 37, 42, 58, 66, 99, 107, 153, 169, 184, 192, 210]

**Artificial Intelligence:** [3, 36, 39, 70, 89, 134, 143, 162, 171, 191, 203, 206, 216]

**Augmented Reality:** [46, 145]

**Automation:** [39, 69, 100, 109, 122, 212]

**Automotive Technology:** [4, 15, 115, 119]

**BeagleBone:** [119]

**Biomedical Engineering:** [17, 32, 47, 51, 54, 58, 83, 85, 90, 98, 135, 160, 163, 174, 179, 182, 194, 198, 201, 215]

**Broadcast Software:** [128]

**Circuit Modeling:** [31, 37, 77, 95, 125]

**Cloud Computing:** [8, 21, 56, 65, 80, 136, 139, 143, 183, 206]

**Computer Vision:** [3, 20, 26, 38, 39, 46, 70, 84, 87, 125, 162, 171, 202, 207, 212]

**Content Management System:** [67, 126]

**Control Systems:** [42, 77, 122, 141, 175, 181, 192]

**Cryptography:** [21, 29, 34, 43, 52, 120, 168, 178]

**DSP:** [157, 186]

**Data Analytics:** [19, 36, 42, 61, 71, 96, 102, 109, 126, 137, 143, 155, 159, 161, 166, 172, 197, 199, 209, 214]

**Data Mining:** [19, 49, 71, 159, 161, 170, 197, 209, 214]
Databases: [5, 21, 30, 49, 71, 73, 75, 80, 93, 99, 126, 132, 134, 137, 139, 142, 158, 162, 172, 190]
Device Design: [7, 9, 13, 61, 125, 151, 179, 201, 215]
Distributed Systems: [8, 21, 29, 65, 183]
E-Commerce: [45, 137, 148]
Educational: [7, 25, 73, 145, 176]
Electric Generation: [44, 114, 140]
Embedded Systems: [28, 31, 37, 39, 84, 107, 119, 186]
Energy Conservation: [2, 50, 114, 164]
Environmental Mapping: [28, 93]
Finite Element Analysis: [54, 68, 104, 129, 151, 189]
Fluid Mechanics: [9, 27, 79, 141, 144, 169, 173, 174, 185, 189, 201]
GPS GIS: [11, 88, 108, 139]
Gaming: [14, 33, 89, 125, 128, 211]
Graphics: [127, 128]
Image Video Processing: [20, 38, 39, 46, 87, 125, 127, 162, 197, 207, 212]
Information Retrieval: [8, 20, 21, 23, 162, 190]
Instant Messaging: [93]
Intelligence Pattern Matching: [203]
Internet of Things: [25, 29, 34, 42, 55, 84, 87, 99, 106, 111, 124, 162, 205]
Lean Manufacturing: [63, 88, 92, 109, 160, 212]
Mechanical Design and Manufacture: [4, 9, 13, 15, 28, 72, 82, 100, 115, 117, 129, 131, 151, 154, 163, 169]
Mechatronic Systems: [28, 37, 77, 100, 119, 133, 162, 175, 181, 192, 212]
Mobile App: [3, 5, 8, 11, 16, 21, 24, 26, 35, 43, 46, 53, 59, 62, 64, 73, 78, 80, 96, 112, 123, 132, 136, 137, 139, 142, 143, 145, 147, 162, 166, 181, 184, 187, 190, 196, 197, 202, 203]
Model View Controller: [1, 49, 143, 170, 172]
Motion Analysis: [15, 27, 99, 100, 173]
Multimedia: [8, 20]
Natural Language Processing: [102, 143, 155, 199, 200, 206]
Network Applications: [76, 111, 142, 183]
Optical Character Recognition: [26, 38, 125, 202]
Optical Communications: [12, 105]
Power Electronics: [77, 177, 213]
RaspberryPi: [25, 29, 37, 87, 99, 106, 124]
Renewable Energy Technology: [12, 44, 66, 114]
Robotics: [28, 94, 100, 117, 133, 153, 212]
Security: [21, 148, 207]
Sensor Data: [7, 28, 29, 42, 48, 57, 66, 78, 99, 162, 192]
Sensor Technology: [28, 42, 117, 167, 188]
Simulation: [44, 77, 82, 88, 94, 97, 111, 118, 131, 133, 164, 172, 173, 181, 189, 192]
Social Networking: [8, 49, 80, 93, 113]
Software Development: [1, 3, 7, 8, 20, 21, 28, 31, 37, 38, 49, 56, 87, 93, 94, 99, 113, 118, 125, 127, 131, 134, 139, 149, 162, 170, 181, 186, 195, 202, 211, 214, 216]
Speech Recognition: [8, 152]
Statistical Analysis: [19, 40, 88, 102, 109, 197, 199, 214]
Telecommunications: [149, 167]
Thermodynamics: [9, 169, 173]
Tissue Engineering: [51, 74, 83, 85, 90, 144, 174, 182]
Vehicle Control: [15]
Virtual Reality: [133, 210]
Water Treatment: [18, 22, 79, 164, 165]
Wearable Technology: [106, 124, 166, 197]
Web Application: [1, 6, 21, 23, 30, 35, 41, 43, 45, 49, 56, 57, 60, 67, 75, 81, 86, 91, 93, 101, 102, 103, 108, 110, 113, 116, 121, 126, 127, 132, 142, 143, 145, 148, 149, 150, 155, 158, 166, 168, 170, 172, 190, 193, 199, 200, 204, 206, 209]
Wireless Technology: [97, 106, 107, 124, 130, 190, 196, 197]
## Project Listing

<table>
<thead>
<tr>
<th>No.</th>
<th>Name(s)</th>
<th>Project Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cathal Conroy</td>
<td>CrpyptoCert</td>
</tr>
<tr>
<td>2</td>
<td>Sean Giles</td>
<td>Energy Efficiency for Cleanrooms: Modelling Energy Requirements</td>
</tr>
<tr>
<td>3</td>
<td>Cathal Neary</td>
<td>SightSeer Android Application</td>
</tr>
<tr>
<td>4</td>
<td>Derek Dunne</td>
<td>Development of Test Rig to evaluate suspension dampers in line with the NCT test</td>
</tr>
<tr>
<td>5</td>
<td>Rebecca Fenlon, Rebecca Sharlott</td>
<td>DigiStay</td>
</tr>
<tr>
<td>6</td>
<td>Robert O’Connor</td>
<td>Tegasc Dom</td>
</tr>
<tr>
<td>7</td>
<td>Matthew Smyth</td>
<td>RS19 – Punched Paper-Tape Reader</td>
</tr>
<tr>
<td>8</td>
<td>Seamus Kelly</td>
<td>Chirpy – The spoken social network</td>
</tr>
<tr>
<td>9</td>
<td>Keith Timmons</td>
<td>Cistern Noise Reduction Device &amp; Water Hammer</td>
</tr>
<tr>
<td>10</td>
<td>Dean Lalor</td>
<td>Diabetes Management Android App for Children and Parents</td>
</tr>
<tr>
<td>11</td>
<td>Cillian Rice</td>
<td>Bicycle Navigation System</td>
</tr>
<tr>
<td>12</td>
<td>Fergal Conlon</td>
<td>A Novel Anti Reflection Coating for a Solar Cell</td>
</tr>
<tr>
<td>13</td>
<td>Karl Morgan</td>
<td>Croke Park Turf Testing Device</td>
</tr>
<tr>
<td>14</td>
<td>Owen Flynn</td>
<td>Sci Fi Game</td>
</tr>
<tr>
<td>15</td>
<td>Sean Brady</td>
<td>Design of Rear Chassis and Drivetrain Components for Greenpower Project</td>
</tr>
<tr>
<td>16</td>
<td>Bronagh Hennessy, Darina Costelloe</td>
<td>ParkShark</td>
</tr>
<tr>
<td>17</td>
<td>Elizabeth Akintola</td>
<td>Fabrication and characterisation of Nano sized hydroxyapatite particles for use as non-viral vectors for gene delivery</td>
</tr>
<tr>
<td>18</td>
<td>Christopher Doogan</td>
<td>Cost Benefit Analysis of a Wastewater Treatment Plant</td>
</tr>
<tr>
<td>19</td>
<td>Brian Kilduff</td>
<td>Basketball Statistics Collector and Analyser</td>
</tr>
<tr>
<td>20</td>
<td>Cathal O'Reilly</td>
<td>Enabling Adaptation of Mulsemmedia Content</td>
</tr>
<tr>
<td>21</td>
<td>Cillian Mc Neill</td>
<td>MiD – My Identity</td>
</tr>
<tr>
<td>22</td>
<td>John Brady</td>
<td>A Diffused Air Aeration System to be used at Blessington Street Basin</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>23</td>
<td>Emi Janela Bumanglag</td>
<td>A sound similarity search engine for audiovisual archives</td>
</tr>
<tr>
<td>24</td>
<td>Ali Raza</td>
<td>Just Ask</td>
</tr>
<tr>
<td>25</td>
<td>Shane Hoare</td>
<td>Applications of a Raspberry Pi Based Interface</td>
</tr>
<tr>
<td>26</td>
<td>Amirsad Zalli, Fionn Fitzgibbon</td>
<td>SmartSight – Visual Assistive Technology</td>
</tr>
<tr>
<td>27</td>
<td>Niall Gilsenan</td>
<td>Testing of Curing Adhesives</td>
</tr>
<tr>
<td>28</td>
<td>Ahmed Ibrahim Aly</td>
<td>A Low-Cost Near-Range Lidar Scanner</td>
</tr>
<tr>
<td>29</td>
<td>Sunayana Kantimahanthi</td>
<td>Blockchain &amp; IoT: Using Peer-to-Peer Capabilities of a Distributed Ledger to Validate and Transfer Data</td>
</tr>
<tr>
<td>30</td>
<td>Gavin Connorton, Conor McGrath</td>
<td>Pennywise – The Micro-investing Platform</td>
</tr>
<tr>
<td>31</td>
<td>Conor Shirren</td>
<td>Electronic Drum Module</td>
</tr>
<tr>
<td>32</td>
<td>Mieke Kiernan</td>
<td>Development of a device/material to replace or augment the existing coronary stent which will inhibit or reduce cardiac reperfusion injuries</td>
</tr>
<tr>
<td>33</td>
<td>Arpit Chaudhary</td>
<td>Mathematics for Primary School</td>
</tr>
<tr>
<td>34</td>
<td>Malachy Brennan</td>
<td>Adaptation of Blockchain Technology for Secure Peer-to-Peer IoT Data Exchange</td>
</tr>
<tr>
<td>35</td>
<td>Damien McGlynn, Jack Bentley, Kevin Lynam</td>
<td>Fetcher</td>
</tr>
<tr>
<td>36</td>
<td>Lisa Koilparambil</td>
<td>Finwhiz – Financial Market Analysis web app</td>
</tr>
<tr>
<td>37</td>
<td>Luke Crawley</td>
<td>MIDI Wind Controller</td>
</tr>
<tr>
<td>38</td>
<td>Shunta Minaguchi</td>
<td>Sheet Music Reader</td>
</tr>
<tr>
<td>39</td>
<td>Zeynep Naz Tugrul</td>
<td>Person Re-identification on a Neural Compute Stick</td>
</tr>
<tr>
<td>40</td>
<td>Padraig McCahey</td>
<td>Normality Test Analysis</td>
</tr>
<tr>
<td>41</td>
<td>Rupak Thapa</td>
<td>Unistart</td>
</tr>
<tr>
<td>42</td>
<td>Robert Beirne</td>
<td>The Internet of Things: A sensor fusion application using MATLAB and ThingSpeak</td>
</tr>
<tr>
<td>43</td>
<td>Daniel Holton</td>
<td>NFC-Capable Password Storage Application</td>
</tr>
<tr>
<td>44</td>
<td>Conor Forde</td>
<td>Analysing the challenges faced with large scale renewable energy integration in Ireland</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>45</td>
<td>Aaron Gillespie, Evan Doherty</td>
<td>ICOHub</td>
</tr>
<tr>
<td>46</td>
<td>John O’Callaghan</td>
<td>An augmented reality pedestrian navigation system</td>
</tr>
<tr>
<td>47</td>
<td>Mark Mc Donald</td>
<td>Development of a Probe Tack Experiment for Measuring the Adhesiveness of Biomaterials</td>
</tr>
<tr>
<td>48</td>
<td>Louis Ronan</td>
<td>Confined Atmospheric Pulsed Laser Deposition</td>
</tr>
<tr>
<td>49</td>
<td>Adam Pegman</td>
<td>Detecting brigading on social media with machine learning</td>
</tr>
<tr>
<td>50</td>
<td>Maryam AlSaqry</td>
<td>Fuel Cell Storage</td>
</tr>
<tr>
<td>51</td>
<td>Greg Campion</td>
<td>Development and Characterisation of Braided Fibre Bundle Structures for Tendon Substitution</td>
</tr>
<tr>
<td>52</td>
<td>Anna Parisi – Ploumpi</td>
<td>Notary of Digital Assets</td>
</tr>
<tr>
<td>53</td>
<td>Aisling Casserly</td>
<td>Gaa Game Time Statistics</td>
</tr>
<tr>
<td>54</td>
<td>Ross Gordon</td>
<td>Finite element modelling of damage and proposed repairs to the distal femur/Condyles</td>
</tr>
<tr>
<td>55</td>
<td>Barry O’Sullivan, Seán O’Connor</td>
<td>BluBox</td>
</tr>
<tr>
<td>56</td>
<td>Bernard O’Connor</td>
<td>Source Code Analyser Engine</td>
</tr>
<tr>
<td>57</td>
<td>Seamus Doherty</td>
<td>IoT Hub using JavaScript</td>
</tr>
<tr>
<td>58</td>
<td>Graham Vaughey</td>
<td>Development of a Low Cost Plantar Pressure Measurement Device</td>
</tr>
<tr>
<td>59</td>
<td>Liam Nunez</td>
<td>Spotted</td>
</tr>
<tr>
<td>60</td>
<td>Nathan McAloon, Dilllon Dooley</td>
<td>MiPT</td>
</tr>
<tr>
<td>61</td>
<td>Neil Martin</td>
<td>Sound Generation and Mitigation in a water mill</td>
</tr>
<tr>
<td>62</td>
<td>Méabh Horan</td>
<td>Diagnose Dyscalculia</td>
</tr>
<tr>
<td>63</td>
<td>Tobe Nwosu</td>
<td>The Impact Of A Bottleneck On A Lean Manufacturing System</td>
</tr>
<tr>
<td>64</td>
<td>Emer Hennebry</td>
<td>NFC Receipts App</td>
</tr>
<tr>
<td>65</td>
<td>Darragh Griffin, Ryan Connell, Conor Griffin</td>
<td>Cerberus MapReduce Framework</td>
</tr>
<tr>
<td>66</td>
<td>Sean Finn</td>
<td>Performance Monitoring of Lithium Ion Cells.</td>
</tr>
<tr>
<td>67</td>
<td>Graham Bartley</td>
<td>CoderDojo Zen Projects</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>68</td>
<td>Peter Hogan</td>
<td>Experimental and Numerical Investigation of the Rubber-Pad Forming Process of Aircraft Components</td>
</tr>
<tr>
<td>69</td>
<td>Jake Salveta</td>
<td>Developments of a Digital Twin for the FMS Rig</td>
</tr>
<tr>
<td>70</td>
<td>Sakthignana Sundaram Somaskandan</td>
<td>Automatic Fashion Item Identification and Classification using Deep Learning based Computer Vision</td>
</tr>
<tr>
<td>71</td>
<td>Elisabeth Kraman</td>
<td>User Behaviour Monitoring</td>
</tr>
<tr>
<td>72</td>
<td>Ahmed Mohd Ahameed</td>
<td>Re-Enforcing Nano-Particle Integration into Metal AM and Produced Part Characterisation</td>
</tr>
<tr>
<td>73</td>
<td>Ellen Kennedy</td>
<td>WhichPrep</td>
</tr>
<tr>
<td>74</td>
<td>Yi Nan</td>
<td>Assessment of injectability of hydrogels designed for bone repair applications</td>
</tr>
<tr>
<td>75</td>
<td>Shauna Barry</td>
<td>Styled Solutions</td>
</tr>
<tr>
<td></td>
<td>Roisin Crowley</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Filip Nikolic</td>
<td>ASDN – Automated Software defined Networking</td>
</tr>
<tr>
<td>77</td>
<td>Aoife Grady</td>
<td>Stability Analysis of Compensated Voltage Regulators</td>
</tr>
<tr>
<td>78</td>
<td>Adráin Whelan</td>
<td>Sensor fusion based indoor positioning system</td>
</tr>
<tr>
<td>79</td>
<td>Ciaran Gibney</td>
<td>Design and build a new pumping station for microbubble generation</td>
</tr>
<tr>
<td>80</td>
<td>Kevin Nangle</td>
<td>C-Me</td>
</tr>
<tr>
<td></td>
<td>Seán Motherway</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Brendan McManus</td>
<td>Guild Wars 2 Companion App</td>
</tr>
<tr>
<td>82</td>
<td>Robert Ennis</td>
<td>Adjustable damper for external door</td>
</tr>
<tr>
<td>83</td>
<td>Matthew McDermott</td>
<td>Development of a Degradable Embolic Hydrogel Material for the Temporary Embolization of Liver Tumours</td>
</tr>
<tr>
<td>84</td>
<td>Mark McHugh</td>
<td>Software Configurable Hardware Architectures for Machine Vision Algorithms Implemented on Zynq</td>
</tr>
<tr>
<td>85</td>
<td>Seán Elliott</td>
<td>3D Printing of Calcium Phosphate Based Scaffolds</td>
</tr>
<tr>
<td>86</td>
<td>Alannah McCabe</td>
<td>TrackMyDiabetes</td>
</tr>
<tr>
<td></td>
<td>Sarah Kelly</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>Kieran Turgoose</td>
<td>PiMirror</td>
</tr>
<tr>
<td>88</td>
<td>Jack Keogh</td>
<td>Modelling and Analysis of Closed Loop Supply Chain Management for Reusable Articles</td>
</tr>
<tr>
<td>89</td>
<td>Christopher Durning</td>
<td>Neural Jump</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>90</td>
<td>Peter Cullen</td>
<td>Development of Scaffolds for Tissue Engineering Applications with Optimized Porosity and Mechanical Properties.</td>
</tr>
<tr>
<td>91</td>
<td>Daniel Cahill</td>
<td>Delicious</td>
</tr>
<tr>
<td></td>
<td>Shane Rooney</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>David Kilbridge</td>
<td>Production and inventory control strategies for systems manufacturing perishable goods</td>
</tr>
<tr>
<td>93</td>
<td>Adrian James Rabbitt</td>
<td>Jobder</td>
</tr>
<tr>
<td>94</td>
<td>Seamus Stone</td>
<td>An investigation of a MATLAB simulation environment for multi-agent mobot path planning</td>
</tr>
<tr>
<td>95</td>
<td>Basim Humaid Al Dhawi</td>
<td>Tuned Amplifier Simulation and Study</td>
</tr>
<tr>
<td>96</td>
<td>Stephen Heerey</td>
<td>Swift</td>
</tr>
<tr>
<td></td>
<td>Darren Clarke</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>Adam Kiely</td>
<td>Haptic Feedback for Light Aircraft Flight Condition Awareness</td>
</tr>
<tr>
<td>98</td>
<td>Scott Byrne</td>
<td>Development of Enhanced Fixation Techniques for Bio-Material Devices for Cartilage Repair</td>
</tr>
<tr>
<td>99</td>
<td>Denis Atkinson</td>
<td>MySpy</td>
</tr>
<tr>
<td>100</td>
<td>Egidijus Ambrakaitis</td>
<td>Designing and building a self-balancing ball-bot</td>
</tr>
<tr>
<td>101</td>
<td>Dale Stewart</td>
<td>SaorSchool</td>
</tr>
<tr>
<td></td>
<td>Shaun Ó Donnagáin</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>Rachel Solomon</td>
<td>Analyzing Online User Behaviour</td>
</tr>
<tr>
<td>103</td>
<td>Sean Matthew Ladigan</td>
<td>Applying Arbitrage Techniques to Online Retail Platforms</td>
</tr>
<tr>
<td>104</td>
<td>Shane Hudson</td>
<td>Finite Element Analysis of Simple Snap-Fits</td>
</tr>
<tr>
<td>105</td>
<td>Maadh Hamed Salim Alnaabi</td>
<td>Study of a Si based modulator</td>
</tr>
<tr>
<td>106</td>
<td>Neil Geoghegan</td>
<td>Monitour</td>
</tr>
<tr>
<td>107</td>
<td>Steven Flynn</td>
<td>Passive radar based intruder detection</td>
</tr>
<tr>
<td>108</td>
<td>Finnian O’Neill</td>
<td>Scout Ahead</td>
</tr>
<tr>
<td>109</td>
<td>Stephen Bradley</td>
<td>Statistical Analysis and Improvement of Multiple High-Speed Assembly Cells through Lean and Six Sigma.</td>
</tr>
<tr>
<td>110</td>
<td>Andrew Twohig</td>
<td>Ultimate Frisbee Tournament Organiser</td>
</tr>
<tr>
<td>111</td>
<td>Dylan Redmond</td>
<td>Scaling in Internet of Things Networking</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>112</td>
<td>Adam Kelly Pawel Olkowicz</td>
<td>Simpli-Fi</td>
</tr>
<tr>
<td>113</td>
<td>Pauric McGroarty Muhamed Sabic Cian Farrell</td>
<td>Social Ride</td>
</tr>
<tr>
<td>114</td>
<td>Jochelle Laguipo</td>
<td>Hybrid Turbine Electrolyser</td>
</tr>
<tr>
<td>115</td>
<td>Rian John Molloy</td>
<td>Improved Drivetrain for Greenpower Car</td>
</tr>
<tr>
<td>116</td>
<td>Talah Ishfaq</td>
<td>GetGoing</td>
</tr>
<tr>
<td>117</td>
<td>Lucas Santos</td>
<td>Design, Build and Test a Liquid Metal Strain Gauge</td>
</tr>
<tr>
<td>118</td>
<td>Aaron Edgeworth</td>
<td>Simulation of Differing Forms of Economic Governance</td>
</tr>
<tr>
<td>119</td>
<td>Carolyn Crampton</td>
<td>CAN Bus Test-Bed and Messaging Interface in Matlab</td>
</tr>
<tr>
<td>120</td>
<td>Patrick Shortall</td>
<td>Lightweight Hardware Architectures of the LEA Block Cipher for FGPA</td>
</tr>
<tr>
<td>121</td>
<td>Kevin O’Neill</td>
<td>Local Jobs</td>
</tr>
<tr>
<td>122</td>
<td>Senan Hughes</td>
<td>Development of Virtual Twin for the FMS Rig</td>
</tr>
<tr>
<td>123</td>
<td>Keith Rooney Paul O’Sullivan</td>
<td>CineSkip</td>
</tr>
<tr>
<td>124</td>
<td>Conor Egan</td>
<td>Smart Watch/Fitness Monitor</td>
</tr>
<tr>
<td>125</td>
<td>Stanislav Jolondcovschi</td>
<td>Opto-Electronic Shooting Rig</td>
</tr>
<tr>
<td>126</td>
<td>Arran Farrell Anita Okoye</td>
<td>AALicenseManager</td>
</tr>
<tr>
<td>127</td>
<td>Jaya Kumar</td>
<td>Development of a web-based volume rendering system using X3DOM</td>
</tr>
<tr>
<td>128</td>
<td>Daire O’Bruachail</td>
<td>Screen Capture and Livestreaming Application</td>
</tr>
<tr>
<td>129</td>
<td>Ali Al Makhmary</td>
<td>Design and Manufacture of an Attachment for Wood Milling Router Tools</td>
</tr>
<tr>
<td>130</td>
<td>James McDonald Gavin Strong Jack Tuffy</td>
<td>L.A.M.P</td>
</tr>
<tr>
<td>131</td>
<td>Mohamed Al-Naamani</td>
<td>Simulation, Design and Manufacture of Non Circular Gears</td>
</tr>
<tr>
<td>132</td>
<td>Owen Matthews Pàdriag Ó Cuirc Bolta</td>
<td>Eitlean Booking</td>
</tr>
<tr>
<td>133</td>
<td>Emmet Cullen</td>
<td>Virtual Robot Experimentation Platform for Path Planning Investigation</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>134</td>
<td>Jordan Mulvaney</td>
<td>DCU Damo</td>
</tr>
<tr>
<td>135</td>
<td>Rebecca Guyett</td>
<td>Short fibre reinforced calcium phosphate bone cement</td>
</tr>
<tr>
<td>136</td>
<td>Lonneke Schutte</td>
<td>Student Attendance Tracking</td>
</tr>
<tr>
<td>137</td>
<td>Conor Marshall</td>
<td>Swiped</td>
</tr>
<tr>
<td></td>
<td>Nathan Prendergast</td>
<td></td>
</tr>
<tr>
<td>138</td>
<td>Daragh Lawlor</td>
<td>Letter Writing Checker</td>
</tr>
<tr>
<td>139</td>
<td>Renatas Nedzveckas</td>
<td>Never-Lost</td>
</tr>
<tr>
<td>140</td>
<td>Rory Clear</td>
<td>Modelling of Distributed Small Scale Solar Energy Systems</td>
</tr>
<tr>
<td>141</td>
<td>Niall O’Connor</td>
<td>Design and control a new pumping system for steady flow</td>
</tr>
<tr>
<td>142</td>
<td>Andreas Poppmeier, Conor Dolan</td>
<td>PitchBook – A service which allows users to book and manage sports pitches in the form of a web application</td>
</tr>
<tr>
<td>143</td>
<td>Ross Franey</td>
<td>Braikout – Cryptocurrency &amp; FX Trading Platform</td>
</tr>
<tr>
<td>144</td>
<td>Seán Curtis</td>
<td>Development of test rig to assess the functional properties of tissue engineered heart valves</td>
</tr>
<tr>
<td>145</td>
<td>Odhrán Daly</td>
<td>Maths AR</td>
</tr>
<tr>
<td>146</td>
<td>Daniel Whitty</td>
<td>A comparison of results filtering nanoparticles manually and using Uv-Vis Spectroscopy to determine the weight and size distributions of colloids</td>
</tr>
<tr>
<td>147</td>
<td>Mark Dunne</td>
<td>Functional Specification</td>
</tr>
<tr>
<td>148</td>
<td>Conor Henry, Danny Ó Gallchoir</td>
<td>BlockTract</td>
</tr>
<tr>
<td>149</td>
<td>Igor Strelkov</td>
<td>TeachMeCode</td>
</tr>
<tr>
<td>150</td>
<td>Kvetoslava Sliacanova</td>
<td>Nutrition and Dieting web application.</td>
</tr>
<tr>
<td>151</td>
<td>Robin Blakey</td>
<td>Electronic Bass Drum Design</td>
</tr>
<tr>
<td>152</td>
<td>Ciarán Murphy</td>
<td>Ebook Reader</td>
</tr>
<tr>
<td>153</td>
<td>Liam Clarke</td>
<td>Fibre Reinforced Actuators</td>
</tr>
<tr>
<td>154</td>
<td>Sean Rocks</td>
<td>Design, Build and Testing of a Pneumatic Air Muscle</td>
</tr>
<tr>
<td>155</td>
<td>Ina Mari Fe Pondoc</td>
<td>Social Media User Behaviour Analyser based on Gender Studies</td>
</tr>
<tr>
<td>156</td>
<td>Niall O’Shaughnesssy</td>
<td>Ion Doped Calcium Phosphate Cement</td>
</tr>
<tr>
<td>157</td>
<td>Nathan Mindomba</td>
<td>GPGPU Accelerated Spectral analysis</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>158</td>
<td>Shane Farrelly Ian McEvoy</td>
<td>Quoter</td>
</tr>
<tr>
<td>159</td>
<td>Glen Devlin</td>
<td>Car Deal Spotter</td>
</tr>
<tr>
<td>160</td>
<td>Haifa Asiri</td>
<td>Impact of Preventive Maintenance on Lean Manufacturing Productivity</td>
</tr>
<tr>
<td>161</td>
<td>Rahma Ahmed</td>
<td>Visualize Dataset</td>
</tr>
<tr>
<td>163</td>
<td>Niamh Murphy</td>
<td>Development of a Tough Adhesive Calcium Phosphate Cement</td>
</tr>
<tr>
<td>164</td>
<td>Cian Brogan</td>
<td>Control of Reverse Osmosis Fouling Mitigation</td>
</tr>
<tr>
<td>165</td>
<td>Oliver Hamilton</td>
<td>Hybrid Membrane Reverse Osmosis</td>
</tr>
<tr>
<td>166</td>
<td>Chris Horgan Sarah-Jane Irwin</td>
<td>HealthKick</td>
</tr>
<tr>
<td>167</td>
<td>Eoin Morrissey</td>
<td>Design and Development of a Software Defined Radio-Based System for 21cm Wavelength Radio Astronomy</td>
</tr>
<tr>
<td>168</td>
<td>Patrick Morris</td>
<td>Electio – Applications of Electoral Systems using the Ethereum Blockchain</td>
</tr>
<tr>
<td>169</td>
<td>Cian Byrne</td>
<td>Test and Model the Interaction of Immersed Solids in Fluid Flow</td>
</tr>
<tr>
<td>170</td>
<td>Simon Lowry</td>
<td>Bookworm</td>
</tr>
<tr>
<td>171</td>
<td>Kevin Bambrick</td>
<td>Visual Feature Encoding &amp; Transmission from Edge Devices</td>
</tr>
<tr>
<td>172</td>
<td>Sean Sinnott</td>
<td>Cryptocurrency Trading Strategy Dashboard</td>
</tr>
<tr>
<td>173</td>
<td>Cathal Duggan</td>
<td>Design and build a test rig for the study of a reciprocating pump</td>
</tr>
<tr>
<td>174</td>
<td>Mark Heaney</td>
<td>The Manufacture of Porous Tissue Engineering Scaffolds using Supercritical Fluid</td>
</tr>
<tr>
<td>175</td>
<td>Damien Moorehead</td>
<td>A PID control rig to demonstrate the characteristics of proportional, integral and derivative control</td>
</tr>
<tr>
<td>176</td>
<td>Sharawn Ahaotu Simelane</td>
<td>Development and testing of a Project Based Learning approach</td>
</tr>
<tr>
<td>177</td>
<td>John Connolly</td>
<td>Investigation into the existence and control of chaos in switching converters</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>178</td>
<td>Neto Ukpong</td>
<td>Efficient FPGA Implementation of the Lightweight LED Block Cipher</td>
</tr>
<tr>
<td>179</td>
<td>Aidan Jones</td>
<td>Development of a device for the narrowing of the pylorus to help facilitate weight loss</td>
</tr>
<tr>
<td>180</td>
<td>Kevin Sweeney</td>
<td>Multiplayer Word Game</td>
</tr>
<tr>
<td>181</td>
<td>Paul Queally Gallagher</td>
<td>Self Balancing Two Wheeled Vehicle</td>
</tr>
<tr>
<td>182</td>
<td>Mark O Connor</td>
<td>Electrospinning of fibre-gel composites for future blood vessel applications</td>
</tr>
<tr>
<td>183</td>
<td>Terry Bolt</td>
<td>Heracles</td>
</tr>
<tr>
<td>184</td>
<td>Mark McAdam</td>
<td>Delock decentralized rental system</td>
</tr>
<tr>
<td>185</td>
<td>Mohammed Hammed AL Adawani</td>
<td>Microbubble generation for wastewater processing: Mixing Tank Design</td>
</tr>
<tr>
<td>186</td>
<td>Jack McDonald</td>
<td>A PYNQ-based Logic Analyzer and Pattern Generator</td>
</tr>
<tr>
<td>187</td>
<td>Ciaran Moylan</td>
<td>CompShare</td>
</tr>
<tr>
<td>188</td>
<td>Stephen Kenny</td>
<td>Aircraft Airspeed Indicator Tester</td>
</tr>
<tr>
<td>190</td>
<td>Amy Leitch</td>
<td>HeadCount: An NFC Attendance Tracker</td>
</tr>
<tr>
<td>191</td>
<td>Seán Hutchinson</td>
<td>‘MozAIrt – Music Learning Neural Network’</td>
</tr>
<tr>
<td>192</td>
<td>Shane Bannon</td>
<td>Thermal Control System</td>
</tr>
<tr>
<td>193</td>
<td>Eoin Magner</td>
<td>Trouve – Area Advisor</td>
</tr>
<tr>
<td>194</td>
<td>Oisín Carr</td>
<td>Experimental Dynamic Protocol for the Simulation of Spinal Burst Fractures</td>
</tr>
<tr>
<td>195</td>
<td>Suzanne Campbell</td>
<td>CoderDojo Universal Login</td>
</tr>
<tr>
<td>196</td>
<td>Jack Ryan Oran Lawton</td>
<td>UniPay</td>
</tr>
<tr>
<td>197</td>
<td>Laura Araviciute</td>
<td>Memorability Toolkit</td>
</tr>
<tr>
<td>198</td>
<td>Jennifer Daly</td>
<td>Design of a Novel Medical Device to Aid the Delivery of Enduragel™ in the Treatment of Cerebral Aneurysms</td>
</tr>
<tr>
<td>199</td>
<td>Daniel O’Sullivan</td>
<td>Job Analytics</td>
</tr>
<tr>
<td>200</td>
<td>Ian Kelly</td>
<td>DCU Personal Assistant Chat Bot</td>
</tr>
<tr>
<td>No.</td>
<td>Name(s)</td>
<td>Project Title</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>201</td>
<td>Thomas Walsh</td>
<td>Design of a disposable cartridge for RapiPlex Diagnostic Reader capable of testing for six Analytes</td>
</tr>
<tr>
<td>202</td>
<td>Claire-Anne MacDonagh</td>
<td>MySpend</td>
</tr>
<tr>
<td>203</td>
<td>Jesse Balfe</td>
<td>Rey-Osterrieth Test for iPad</td>
</tr>
<tr>
<td>204</td>
<td>Scott Dermody, Jordan Hughes</td>
<td>Searchee</td>
</tr>
<tr>
<td>205</td>
<td>Niall Quirke</td>
<td>Passive NFC Environmental Sensor</td>
</tr>
<tr>
<td>206</td>
<td>Rory Byrne</td>
<td>LangAssist</td>
</tr>
<tr>
<td>207</td>
<td>Radwan Duadu</td>
<td>Real-time &quot;privacy at source&quot; computer vision system</td>
</tr>
<tr>
<td>208</td>
<td>Stephen Murphy</td>
<td>Air Flow Plate for a Hydrogen Fuel Cell</td>
</tr>
<tr>
<td>209</td>
<td>Niamh Byrne</td>
<td>Bamboozle: Fraud Detection Web Application</td>
</tr>
<tr>
<td>210</td>
<td>Bruce Davidson</td>
<td>Design of a Virtual Reality Interface to Solidworks using the Unity Game Engine</td>
</tr>
<tr>
<td>211</td>
<td>Tríona Barrow</td>
<td>Quest</td>
</tr>
<tr>
<td>212</td>
<td>Osama Hammad</td>
<td>Robotic Vision-Controlled Automated Packing System</td>
</tr>
<tr>
<td>213</td>
<td>Shatha Al Siyabi</td>
<td>Electroluminescence and Efficiency Measurements in Photovoltaic Cells</td>
</tr>
<tr>
<td>214</td>
<td>Conor Smyth</td>
<td>Magic Card Price Predictor</td>
</tr>
<tr>
<td>215</td>
<td>Eoghan Hamill</td>
<td>The Design of a Low-Cost Spirometer for use in Monitoring Respiratory Diseases</td>
</tr>
<tr>
<td>216</td>
<td>Conor Flynn &amp; Jack Smith, Sean Healy &amp; Mladen Kajic, Conor McManus</td>
<td>Skynet</td>
</tr>
<tr>
<td>217</td>
<td>Tom Pellerin</td>
<td>Advanced design &amp; analysis of an Si-based modulator</td>
</tr>
<tr>
<td>218</td>
<td>Alejandro Jaimez Garcia</td>
<td>Detection of trace-gas molecules using an optical dual comb architecture</td>
</tr>
<tr>
<td>219</td>
<td>Alejandro Woodward</td>
<td>Contextual information for speech recognition</td>
</tr>
<tr>
<td>220</td>
<td>Adria Alsina Torra</td>
<td>Narrative Clip</td>
</tr>
<tr>
<td>221</td>
<td>Marta Coll Pol</td>
<td>An investigation into the importance of time and order in the evaluation of visual attention models</td>
</tr>
</tbody>
</table>
School of Computing – Ground Floor Layout

School of Computing – 1st Floor Layout
LAB LG.25 – Project Numbers and Locations

ENTRANCE

1 2 3 4 5
LG25-01 LG25-02 LG25-03 LG25-04 LG25-05

6 7 8 9 10
LG25-06 LG25-07 LG25-08 LG25-09 LG25-10

11 12 13 14 15

16 17 18 19 20

21 22 23 24 25

26 27 28 29 30

ENTRANCE

28
LAB LG.26 – Project Numbers and Locations

<table>
<thead>
<tr>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-01</td>
<td>LG26-02</td>
<td>LG26-03</td>
<td>LG26-04</td>
<td>LG26-05</td>
</tr>
</tbody>
</table>

ENTRANCE

<table>
<thead>
<tr>
<th>40</th>
<th>39</th>
<th>38</th>
<th>37</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-17</td>
<td>LG26-16</td>
<td>LG26-15</td>
<td>LG26-14</td>
<td>LG26-13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>41</th>
<th>42</th>
<th>43</th>
<th>44</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-18</td>
<td>LG26-19</td>
<td>LG26-20</td>
<td>LG26-21</td>
<td>LG26-22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>50</th>
<th>49</th>
<th>48</th>
<th>47</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-33</td>
<td>LG26-32</td>
<td>LG26-31</td>
<td>LG26-30</td>
<td>LG26-29</td>
</tr>
</tbody>
</table>

ENTRANCE

<table>
<thead>
<tr>
<th>51</th>
<th>52</th>
<th>53</th>
<th>54</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-34</td>
<td>LG26-35</td>
<td>LG26-36</td>
<td>LG26-37</td>
<td>LG26-38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>56</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>57</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>58</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>59</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG26-50</td>
</tr>
</tbody>
</table>
LAB LG.27 – Project Numbers and Locations

- 61: LG27-25
- 62: LG27-24
- 63: LG27-23
- 64: LG27-21
- 65: LG27-20
- 66: LG27-19
- 70: LG27-13
- 69: LG27-14
- 68: LG27-15
- 67: LG27-16
- 71: LG27-12
- 72: LG27-11
- 73: LG27-10
- 74: LG27-09
- 75: LG27-07
- 80: LG27-01
- 79: LG27-02
- 78: LG27-03
- 77: LG27-04
- 76: LG27-06
LAB L1.01 – Project Numbers and Locations

ENTRANCE

185 186 187
L101-01 L101-03 L101-06

191 190 189 188
L101-13 L101-11 L101-10 L101-08

192 193 194 195
L101-14 L101-16 L101-18 L101-20

199 198 197 196
L101-27 L101-25 L101-23 L101-21

200 201 202 203
L101-28 L101-30 L101-32 L101-34

207 206 205 204

208 209 210 211
L101-42 L101-44 L101-46 L101-48

215 214 213 212
L101-55 L101-53 L101-51 L101-49

216 217
L101-56 L101-62

221 220 219 218
L114-69 L114-67 L101-66 L101-63
LAB L1.14 – Project Numbers and Locations

ENTRANCE

153 154
L114-11 L114-10 L114-09 L114-08

155 156 157 158
L114-12 L114-13 L114-14 L114-15
L114-16 L114-17 L114-18

163 164 165 166
L114-26 L114-27 L114-28 L114-29
L114-30 L114-31 L114-32

170 169 168 167
L114-39 L114-38 L114-37 L114-36
L114-35 L114-34 L114-33

171 172 173 174
L114-40 L114-41 L114-42 L114-43
L114-44 L114-45 L114-46

178 177 176 175
L114-53 L114-52 L114-51 L114-50
L114-49 L114-48 L114-47

179 180 181 182
L114-54 L114-55 L114-56 L114-57
L114-58 L114-59 L114-60

EXIT

183
L114-61

184
L114-62 114-63 114-64 114-65
LAB L1.25 – Project Numbers and Locations

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td></td>
<td>114</td>
<td></td>
<td>115</td>
<td></td>
<td>116</td>
</tr>
<tr>
<td>L125-28</td>
<td>L125-29</td>
<td>L125-30</td>
<td>L125-31</td>
<td>L125-32</td>
<td>L125-33</td>
<td>L125-34</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>124</td>
<td></td>
<td>123</td>
<td></td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>126</td>
<td></td>
<td>127</td>
<td>128</td>
<td></td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>L125-20</td>
<td>L125-21</td>
<td>L125-22</td>
<td>L125-23</td>
<td>L125-41</td>
<td>L125-42</td>
<td>L125-43</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td></td>
<td>136</td>
<td>137</td>
<td></td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>L125-16</td>
<td>L125-17</td>
<td>L125-18</td>
<td>L125-19</td>
<td>L125-14</td>
<td>L125-13</td>
<td>L125-12</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>134</td>
<td>140</td>
<td></td>
<td>139</td>
<td></td>
<td>141</td>
<td></td>
</tr>
<tr>
<td>L125-16</td>
<td>L125-49</td>
<td>L125-48</td>
<td>L125-15</td>
<td>L125-15</td>
<td>L125-51</td>
<td>L125-50</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>144</td>
<td></td>
<td>146</td>
<td>147</td>
<td></td>
<td>148</td>
</tr>
<tr>
<td>L125-08</td>
<td>L125-56</td>
<td>L125-55</td>
<td>L125-09</td>
<td>L125-10</td>
<td>L125-05</td>
<td>L125-04</td>
</tr>
</tbody>
</table>

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>151</td>
<td></td>
<td>152</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L125-03</td>
<td>L125-02</td>
<td>L125-01</td>
<td>L125-07</td>
<td>L125-06</td>
<td>L125-05</td>
<td>L125-04</td>
</tr>
</tbody>
</table>

ENTRANCE
LAB L1.28 – Project Numbers and Locations

<table>
<thead>
<tr>
<th>107</th>
<th>108</th>
<th>109</th>
<th>110</th>
<th>111</th>
<th>112</th>
</tr>
</thead>
<tbody>
<tr>
<td>L128-00</td>
<td>L128-01</td>
<td>L128-02</td>
<td>L128-03</td>
<td>L128-04</td>
<td>L128-05</td>
</tr>
</tbody>
</table>

ENTRANCE

<table>
<thead>
<tr>
<th>106</th>
<th>105</th>
<th>104</th>
<th>103</th>
<th>102</th>
</tr>
</thead>
<tbody>
<tr>
<td>L128-14</td>
<td>L128-13</td>
<td>L128-12</td>
<td>L128-11</td>
<td>L128-10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>97</th>
<th>98</th>
<th>99</th>
<th>100</th>
<th>101</th>
</tr>
</thead>
<tbody>
<tr>
<td>L128-15</td>
<td>L128-16</td>
<td>L128-17</td>
<td>L128-18</td>
<td>L128-19</td>
</tr>
</tbody>
</table>

ENTRANCE

<table>
<thead>
<tr>
<th>96</th>
<th>95</th>
<th>94</th>
<th>93</th>
<th>92</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>87</th>
<th>88</th>
<th>89</th>
<th>90</th>
<th>91</th>
</tr>
</thead>
<tbody>
<tr>
<td>L128-29</td>
<td>L128-30</td>
<td>L128-31</td>
<td>L128-32</td>
<td>L128-33</td>
</tr>
</tbody>
</table>

ENTRANCE

<table>
<thead>
<tr>
<th>86</th>
<th>85</th>
<th>84</th>
<th>83</th>
<th>82</th>
<th>81</th>
</tr>
</thead>
</table>

82  83  84  85  86  87  88  89  90  91  92  93  94  95  96  97  98  99  100 101 102 103 104 105 106 107 108 109 110 111 112
Project Number: 1
Project Title: CryptoCert
Name: Cathal Conroy
Email: cathal.conroy25@mail.dcu.ie
Programme: Computer Applications
Supervisor: Geoff Hamilton

CryptoCert is a Blockchain-powered web application, which enables companies and other entities to provide clients with secure and verifiable certifications. An entity or Certificate Authority (CA) representative (rep) can interact with CryptoCert’s private blockchain either through the web application, or manually by setting up a node to listen in on the blockchain. CryptoCert also implements SAML authentication, so your company rep can verify themselves via your authentication portal.

Project Area: Model View Controller, Software Development, Web Application
Project Technology: jQuery, MySQL, Python, SQL, Ethereum, Solidity, Django, AWS, SAML

Project Number: 2
Project Title: Energy Efficiency for Cleanrooms: Modelling Energy Requirements
Name: Sean Giles
Email: sean.giles3@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: Lorna.Fitzsimons@dcu.ie

This project deals with energy consumption and energy management in cleanrooms. The aim of this project is to reduce energy usage, carbon footprint and costs, while maintaining the required environmental conditions. This project examines the current control strategy and operation of the cleanroom and also analysing the current energy consumption and environmental conditions. This project involves identifying possible opportunities for energy savings that will reduce the annual cost of operating the cleanrooms.

Project Area: Energy Conservation
Project Technology: Cylon Active Energy

Project Number: 3
Project Title: SightSeer Android Application
Name: Cathal Neary
Email: cathal.neary2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

This project is an easy to use Android Application that allows users to snap a picture of numerous famous landmarks worldwide, with the image then acting as the input for a pre-trained and tested Convolutional Neural Network (CNN). Upon the CNN identifying the image, the user is then presented with interesting facts about the landmark. Travel-lovers worldwide now have the ability to learn about the famous landmarks they visit at the touch of a button.

Project Area: Software Development, Mobile App, Computer Vision, Artificial Intelligence, Android
Project Technology: XML, Python, Java, Eclipse
Faculty of Engineering and Computing
Final Year Projects Expo 2018

Project Number: 4
Project Title: Development of Test Rig to evaluate suspension dampers in line with the NCT test
Name: Derek Dunne
Email: derek.dunne28@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Paul.Young@dcu.ie

This project looks to improve the damper test method used during the NCT. A test rig was constructed to determine the damping rate of a model car suspension for each individual damper. Accelerometers were used with LabVIEW to produce the suspension response of the car.

Project Area: Mechanical Design and Manufacture, Automotive Technology
Project Technology: Solidworks, Matlab, LabVIEW

Project Number: 5
Project Title: DigiStay
Name: Rebecca Fenlon
Email: rebecca.fenlon2@mail.dcu.ie
Name: Rebecca Sharlott
Email: rebecca.sharlott2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Markus.Helfert@dcu.ie

DigiStay is a mobile application designed to improve the overall hotel experience for both hotels and their guests. The app aims to reduce time at reception by digitalising the check-in process. The application generates a QR Code with the user’s data, which will be encrypted and will only be decrypted by the sister application.

Project Area: Android, Databases, Mobile App
Project Technology: Java, SQL, XML, QR Code

Project Number: 6
Project Title: Tegasc Dom
Name: Robert O’Connor
Email: robert.oconnor47@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

This Web Application Tegasc Dom is to provide primary school students an interactive platform to identify key parts of speech in Irish. The pupils teacher will have access to the application and can delegate tasks to specific Users to be completed. A text file will be passed into a language parser which can pick all the different forms of speech within the file. The parsed file will be passed to student who will in turn answer questions regarding the sentence.

Project Area: Web Application
Project Technology: SQL, REST, PHP, MySQL, JavaScript, HTML5, CSS
Project Number: 7
Project Title: RS19 - Punched Paper-Tape Reader
Name: Matthew Smyth
Email: matthew.smyth42@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Ronan.Scaife@dcu.ie

The aim of the project is to allow 1970’s communication technology work with a modern micro controller. Punch tape, an early form of data storage, is the communication medium and the tape reader is the piece of technology which had to be restored to working order. The system was built to output the punch tape message to an LCD screen. The project involves retrofitting design, C++ coding, SolidWorks modelling and extensive testing and analysis.

Project Area: Device Design, Educational, Arduino, Sensor Data, Software Development
Project Technology: C/C++, Solidworks

Project Number: 8
Project Title: Chirpy - The spoken social network
Name: Seamus Kelly
Email: seamus.kelly237@mail.dcu.ie
Programme: Computer Applications
Supervisor: Stephen.Blott@dcu.ie

Chirpy is a new novice social network. It allows users to share updates with speech rather than traditional text. Chirpy aims to reduce the amount of time people waste on social media. By providing an alternative way of receiving updates via speech, the user can focus on other tasks without being distracted. Built using Twitter and Google Drive APIs, we give the power back to the user by giving them the option to modify/delete any data that they share.

Project Technology: Java, Oracle, REST, XML

Project Number: 9
Project Title: Cistern Noise Reduction Device & Water Hammer
Name: Keith Timmons
Email: keith.timmons2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Brian.Corcoran@dcu.ie

This project investigates noise that is being created inside a cistern/water-tank produced when refilling from a valve with a ball-cock attached. The noise created by the refilling was investigated and new devices were designed to combat the noise issue. Components were modelled using SolidWorks and manufactured using 3D printing. Decibel readings were recorded for each concept to analyse the reduction of noise.

Project Area: 3-D Modelling, Device Design, Fluid Mechanics, Mechanical Design and Manufacture, Thermodynamics
Project Technology: Solidworks
Project Number: 10

Project Title: Diabetes Management Android App for Children and Parents
Name: Dean Lalor
Email: dean.lalor4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

A POC Android App aimed primarily at Children with Diabetes and their parents/guardians. It provides an easy and friendly vehicle to help children with this condition manage their sugar levels, diet, and insulin administration, thereby reducing the amount of stress usually associated with this condition, particularly in the early stages. In addition, it allows parents to have access to the required information, such as sugar levels, while providing them with live updates of blood sugar readings as they are taken.

Project Area: Android
Project Technology: Java, XML

Project Number: 11

Project Title: Bicycle Navigation System
Name: Cillian Rice
Email: cillian.rice8@mail.dcu.ie
Programme: Computer Applications
Supervisor: Stephen.Blott@dcu.ie

This project is a bicycle navigation system which will allow cyclists to easily and safely tell the direction of their desired location. A small arduino powered LED display device located in the middle of the bicycle’s handlebars which indicates the correct direction. The device works wirelessly over bluetooth in conjunction with a mobile application for Android smartphones which reads gpx files to guide the user along their route.

Project Area: Android, Arduino, GPS GIS, Mobile App
Project Technology: Java, XML

Project Number: 12

Project Title: A Novel Anti Reflection Coating for a Solar Cell
Name: Fergal Conlon
Email: fergal.conlon3@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Pascal.Landais@dcu.ie

The reflectance of sunlight from the surface of a solar cell is a significant limiting factor in terms of overall efficiency. Existing anti-reflection coatings are expensive to produce and do not eliminate reflectance completely. A novel approach based on the anti reflection properties of a moth’s eye is examined to simulate a cost effective, low reflectance coating. A simulation is developed and then tested for solar cell application. The fabrication process of such a coating is also examined in detail.

Project Area: Renewable Energy Technology, Optical Communications
Project Technology: Matlab
Project Number: 13

Project Title: Croke Park Turf Testing Device  
Name: Karl Morgan  
Email: karl.morgan4@mail.dcu.ie  
Programme: Mechanical and Manufacturing Engineering  
Supervisor: Brian.Corcoran@dcu.ie

This project involves redesigning a turf testing device which tests the pitch performance under different load conditions. The project was carried out in affiliation with Croke Park and is designed based on the design specifications received from the pitch manager. The tests involve measuring the torque required to rotate various types of boot stud arrangements on different surfaces. The device is designed that only 30kg is applied at a given time, regardless of the users weight allowing consistent, reproducible results.

Project Area: 3-D Modelling, Device Design, Mechanical Design and Manufacture  
Project Technology: Solidworks

Project Number: 14

Project Title: Sci Fi Game  
Name: Owen Flynn  
Email: owen.flynn8@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Paul.M.Clarke@dcu.ie

My project is a 3D first person game that has a sci-fi setting. The player must advance through each level of the game by battling against AI controlled opponents. The game utilises the Godot game engine and the logic of the game is written in GDScript which is a python like scripting language used to program for the Godot engine.

Project Area: Gaming  
Project Technology: Godot, GDScript

Project Number: 15

Project Title: Design of Rear Chassis and Drivetrain Components for Greenpower Project  
Name: Sean Brady  
Email: sean.brady52@mail.dcu.ie  
Programme: Mechanical and Manufacturing Engineering  
Supervisor: Paul.Young@dcu.ie

The aim of this project was to produce a new chassis capable of competing in the Formula IET F24+ racing category of the Greenpower racing series. The design was required to adhere to specific rules and regulations and offer enhanced performance over the car currently in use by DCU. Through studying the reaction forces when accelerating, braking and turning the characteristics and performance of the new chassis could be quantified and compared to the current chassis.

Project Area: 3-D Modelling, Automotive Technology, Mechanical Design and Manufacture, Motion Analysis, Vehicle Control  
Project Technology: Excel/VB, Solidworks
Project Number: 16
Project Title: ParkShark
Name: Bronagh Hennessy
Email: bronagh.hennessy6@mail.dcu.ie
Name: Darina Costelloe
Email: darina.costelloe23@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Alan.Smeaton@dcu.ie

ParkShark is a mobile application which aims to revolutionise the traditional parking system by introducing modern technologies such as predictive analytics, and automatic geo-location. ParkShark will help with load balancing across city centre parking locations by offering variable tariffs at competitive prices to its users, based on a pay per demand system. This is driven by an econometric model of parking revenue based on a survey of user acceptance of variable tariffs.

Project Area: Mobile App
Project Technology: Java, Android SDK

Project Number: 17
Project Title: Fabrication and characterisation of Nano sized hydroxyapatite particles for use as non-viral vectors for gene delivery.
Name: Elizabeth Akintola
Email: elizabeth.akintola2@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

A carrier of genetic material in gene therapy is referred to as a vector. Viruses are usually used as vectors due to their high transfection efficiency, dangers associated with using viral vectors have resulted in more research into using non-viral vectors for gene therapies. A material of rising interest in this area is hydroxyapatite. The aim of this project was to optimise the drying process of hydroxyapatite to create a nano-particle which is ideal for the purpose of gene delivery.

Project Area: Advanced Material Engineering, Biomedical Engineering
Project Technology: none

Project Number: 18
Project Title: Cost Benefit Analysis of a Wastewater Treatment Plant
Name: Christopher Doogan
Email: christopher.doogan2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Lorna.Fitzsimons@dcu.ie

This project involved conducting a detailed cost benefit analysis of several process changes carried out at the Anglo Beef Processors wastewater treatment plant in Cahir Co.Tipperary as part of the Exemplar Project. This cost benefit analysis involved learning about and collecting data from the different processes identified at the plant and identifying the main energy consumers and costs associated with these processes. The existing processes were then compared to planned and completed process changes to carry out a cost analysis.

Project Area: Water Treatment
Project Technology: Excel/VB
Project Number: 19

Project Title: Basketball Statistics Collector and Analyser
Name: Brian Kilduff
Email: brian.kilduff3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Roantree@dcu.ie

A basketball team uses the developed Android application as a tool to record statistics about their team during a live game. Statistics are recorded by one person using the application and entering each event by a number of quick and simple taps. All recorded statistics are then analysed. Developed functions automatically produce reports on a team and each player on the team. These reports enable teams to see their weaknesses/strengths, providing them with a chance to improve their game.

Project Area: Android, Data Analytics, Data Mining, Statistical Analysis
Project Technology: Eclipse, Java, Node.js

Project Number: 20

Project Title: Enabling Adaptation of Mulsemedia Content
Name: Cathal O'Reilly
Email: cathal.oreilly77@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Gabriel.Muntean@dcu.ie

The creation of multi-sensory media (mulsemedia) content is a tedious and complicated process. This project aims to accomplish easing this through the use of a user interface and video analysis techniques. The user interface allows users to create mulsemedia files for a video in real-time while the analysis tool automatically detects objects that can be related to mulsemedia effects and adds the associated effect. i.e. outputting the smell of a rose when a rose is in frame.

Project Area: Computer Vision, Information Retrieval, Image Video Processing, Multimedia, Software Development
Project Technology: Eclipse, Java, Python, XML, JSON

Project Number: 21

Project Title: MiD - My Identity
Name: Cillian Mc Neill
Email: cillian.mcneill2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Geoff.Hamilton@dcu.ie

This platform is designed to return the power of ones identity back to the user. This is a challenge, as proving a person’s identity is difficult in a world where private information is shared online daily. Based on a client-server architecture, the user will interact with an Android application, which stores digital, verified documents issued by bodies such as the Passport Authority. Verification of ones identity will use of a distributed, tamper-resistant solution called the Blockchain.

Project Technology: AngularJS, CSS, Docker, Go, HTML5, Java, JavaScript, MySQL, Node.js, Json, Maven, Swagger, Junit, Cucumber, Sonar, Android
Project Number: 22

Project Title: A Diffused Air Aeration System to be used at Blessington Street Basin
Name: John Brady
Email: john.brady38@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Lorna.Fitzsimons@dcu.ie

This project investigates all the possible types of diffused air aeration systems that could be used at the Blessington street basin. This project aims to improve the water quality of the water in the basin by using a low cost but energy efficient diffused air aeration system. This system will introduce more dissolved oxygen into the water and as a result improve the quality of the water in the basin.

Project Area: Water Treatment
Project Technology: Excel/VB

Project Number: 23

Project Title: A sound similarity search engine for audiovisual archives
Name: Emi Janela Bumanglag
Email: emi.bumanglag2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Kevin.McGuinness@dcu.ie

While significant research has been focused on finding images and video clips using image-based examples, far less attention has been paid to searching using audio queries. This project involves building a query by example system that allows a user to search in a large audiovisual collection by providing an audio example via a microphone. The system will then rank the video clips by similarity to the provided sounds and display the top-ranked videos via a custom web app.

Project Area: Information Retrieval, Web Application
Project Technology: Python

Project Number: 24

Project Title: Just Ask
Name: Ali Raza
Email: ali.raza2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Roantree@dcu.ie

Just Ask is a Question-Answer app, where users are Anonymous. The app is location based and also provides a feature of private chat which most similar apps don’t do. The AI detects any hate speech that may be used against other users for a more friendly sociable experience. The AI will also predict questions for the right users based on their interests. So now there is no need to keep them embarrassing questions to yourself, you can Just Ask it.

Project Area: Mobile App
Project Technology: Swift, Firebase, Twitter API, Xcode, Artificial Intelligence
Project Number: 25
Project Title: Applications of a Raspberry Pi Based Interface
Name: Shane Hoare
Email: shane.hoare2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Alan.Kennedy@dcu.ie

The intended outcome for this project was to research the applications of a Raspberry Pi based interface. The project will research and develop an early pre-prototype electronic touchscreen interface. Focusing on the RPi’s ability to be used as the Single Board Computer for the device. The intended end users for the interface are those who are not technologically inclined.

Project Area: Educational, Internet of Things, RaspberryPi
Project Technology: Python, Solidworks

Project Number: 26
Project Title: SmartSight - Visual Assistive Technology
Name: Amirsad Zalli
Email: amirsad.zalli2@mail.dcu.ie
Name: Fionn Fitzgibbon
Email: fionn.fitzgibbon2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

This project is developed to help assist the visually impaired with their daily lives. We plan to help these individuals by identifying different objects for them such as faces, text, and handwriting. Once identified it will then call out the result of the query to let the user know what was captured. This app is available on Android and works by using your smartphone camera to capture images or by using previously saved images.

Project Area: Optical Character Recognition, Mobile App, Android, Computer Vision
Project Technology: Java

Project Number: 27
Project Title: Testing of Curing Adhesives
Name: Niall Gilsenan
Email: niall.gilsenan3@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Harold.Esmonde@dcu.ie

This project investigates the behaviour of a range of adhesives as they cure over time. They are tested using a Micro-Fourier Rheometer [MFR]. As well as testing the behaviour of the adhesives, this project also involved the design and manufacture of a small rig to be incorporated onto the MFR to allow for simpler removal of the adhesives when testing is complete.

Project Area: Fluid Mechanics, Motion Analysis
Project Technology: Solidworks, MFR2100
Project Number: 28  
Project Title: A Low-Cost Near-Range Lidar Scanner  
Name: Ahmed Ibrahim Aly  
Email: ahmed.ibrahim4@mail.dcu.ie  
Programme: Mechatronic Engineering  
Supervisor: Conor.McArdle@dcu.ie

This project investigated the use of low-cost Time-Of-Flight laser-ranging modules to design a cost-effective Lidar scanner for near-range 3D imaging. The project involved the design of a scanner drive motor control system and development of software for interfacing with the ranging module. Software was then developed to interface the device with a PC for data processing and (near) real-time 3D display of the scanned field.

Project Technology: Matlab, Java, Solidworks, OpenGL, C/C++

Project Number: 29  
Project Title: Blockchain & IoT: Using Peer-to-Peer Capabilities of a Distributed Ledger to Validate and Transfer Data  
Name: Sunayana Kantimahanthi  
Email: sunayana.kantimahanthi2@mail.dcu.ie  
Programme: Electronic and Computer Engineering  
Supervisor: Martin.Collier@dcu.ie

The number of internet connected devices is expected to reach 24 billion by 2020 but IoT is riddled with major vulnerabilities. Privacy, authentication, security and most importantly scalability are major barriers for the mass adoption of IoT. The goal is to explore the possibilities/advantages of using Blockchain technology in the context of IoT. Blockchain and IoT offers a new world of promise. This project investigates IOTA, decentralised distributed ledger, that aims to support the growing needs of huge IoT ecosystems.

Project Area: Cryptography, Distributed Systems, Internet of Things, RaspberryPi, Sensor Data  
Project Technology: Docker, JavaScript, Node.js, Python

Project Number: 30  
Project Title: Pennywise - The Micro-investing Platform  
Name: Gavin Connorton  
Email: gavin.connorton4@mail.dcu.ie  
Name: Conor McGrath  
Email: conor.mcgrath42@mail.dcu.ie  
Programme: Enterprise Computing  
Supervisor: Cathal.Gurrin@dcu.ie

Pennywise aims to foster a culture of personal saving and investing in a passive and automatic way. It is a fact that today we are simply not saving enough for the future. Pennywise has the solution: Micro-investing. By rounding up your bank card purchases as you spend and funnelling the balance into your digital savings wallet or personalised investment portfolio, Pennywise will turn your digital spare change into something much more secure for your financial future.

Project Area: Databases, Web Application  
Project Technology: HTML5, JavaScript, JQuery, MySQL, PHP, SQL
**Project Number: 31**

**Project Title:** Electronic Drum Module  
**Name:** Conor Shirren  
**Email:** conor.shirren2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Alan.Kennedy@dcu.ie

This project investigates the possibility of using a 200MHz 32-bit microcontroller paired with a 16-bit analog-digital converter to create a low-cost high-performance electronic drum module capable of performing complex digital signal processing. This project provides a comprehensive introduction to the PIC32 microcontroller using the MPLAB X IDE as a development platform. This project also investigates MPLAB Harmony, a framework which provides a set of peripheral, driver and system libraries that are fully configurable through a graphic user interface (GUI).

**Project Area:** Software Development, Embedded Systems, Circuit Modeling  
**Project Technology:** C/C++, MPLAB X IDE, MPLAB Harmony, MIDI

---

**Project Number: 32**

**Project Title:** Development of a device/material to replace or augment the existing coronary stent which will inhibit or reduce cardiac reperfusion injuries  
**Name:** Mieke Kiernan  
**Email:** mieke.kiernan23@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Owen.Clarkin@dcu.ie

This project aims to develop a replacement material for the current percutaneous coronary intervention, coronary metallic stent. The goal of the material is to degrade over time leaving a fully healed and remodelled coronary artery. The replacement material examined is sodium alginate. The project produces a hydrogel by crosslinking sodium alginate, calcium chloride and glucono-delta-lactone (GDL). Samples of the hydrogel were tested for setting time and degradation, these samples varied in water concentration and GDL to calcium chloride ratio.

**Project Area:** Biomedical Engineering  
**Project Technology:** None

---

**Project Number: 33**

**Project Title:** Mathematics for Primary School  
**Name:** Arpit Chaudhary  
**Email:** arpit.chaudhary2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Monica.Ward@dcu.ie

The project is about helping primary school students to not only understand mathematics but to also master it with the help of our super hero who is travelling to his own home planet. While travelling home he’ll be facing number of obstacles which can only be solved by answering the Mathematical equations. With this game teacher will be able to monitor the progress in Mathematics for each primary school student with the help of the scores they are getting.

**Project Area:** Gaming  
**Project Technology:** Java
**Project Number: 34**

**Project Title:** Adaptation of Blockchain Technology for Secure Peer-to-Peer IoT Data Exchange  
**Name:** Malachy Brennan  
**Email:** malachy.brennan73@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Noel.Murphy@dcu.ie

Blockchain technology has been proposed as a possible solution to the issue of secure and provable peer-to-peer data exchange. One issue associated with the Blockchain approach is that the computation and storage requirements are likely too demanding for low-power low-cost devices which populate the IoT-edge. This project aims to examine the requirements for implementing Blockchain technology for secure and provable peer-to-peer data transactions, to determine the constraints on resource-limited devices, to propose alternative approaches, and to simulate and test these.

**Project Area:** Cryptography, Internet of Things  
**Project Technology:** Ethereum, IPFS, JavaScript, Solidity

---

**Project Number: 35**

**Project Title:** Fetcher  
**Name:** Damien McGlynn  
**Email:** damien.mcglynn5@mail.dcu.ie  
**Name:** Jack Bentley  
**Email:** jack.bentley2@mail.dcu.ie  
**Name:** Kevin Lynam  
**Email:** kevin.lynam3@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Stephen.Blott@dcu.ie

If something is unavailable for purchase online it will, more than likely be unavailable for delivery also. The objective of fetcher is to make anything available for the user from the comfort of their own home. The user selects the location their item needs to be collected from, people with the fetcher application, near that location receive a push notification. These people may bid on the advert and then if accepted they will collect and deliver the item.

**Project Area:** Mobile App, Web Application  
**Project Technology:** CSS, Java, JavaScript, MySQL, PHP

---

**Project Number: 36**

**Project Title:** Finwhiz - Financial Market Analysis web app  
**Name:** Lisa Koilparambil  
**Email:** lisa.koilparambil2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Andrew.McCarren@dcu.ie

Finwhiz is a web application for financial market analysis like Forex and Cryptocurrency. The goal of this application is to ensure users, especially amateurs are able to understand the market trends and the relationships between their interested securities. This goal is achieved by implementing interactive data visualisations and analytical functions like anomaly and correlation. Through the use of this app the user can strategize better, gain faster understanding of the trends of the market and reduce investment risks.

**Project Area:** Data Analytics, Artificial Intelligence  
**Project Technology:** Python, Bootstrap, Node.js, MySQL, JavaScript
Project Number: 37

Project Title: MIDI Wind Controller
Name: Luke Crawley
Email: luke.crawley2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Ronan.Scaife@dcu.ie

This project aims to develop a dummy wind instrument and software that will convert key presses and blowing pressure to MIDI signals. These MIDI signals will then be sent to a MIDI synthesizer to control the notes that are being played.

The use of two different controllers was investigated; The Raspberry Pi and the Arduino. The project was ultimately achieved using an Arduino as the microcontroller, copper windings as the keys and a pressure sensor for the blowing pressure.

Project Technology: C/C++

Project Number: 38

Project Title: Sheet Music Reader
Name: Shunta Minaguchi
Email: shunta.minaguchi3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

The aim is to perform optical music recognition allowing a user to input an image of a sheet of music and have the program output a music file. This python program uses image processing techniques to extract individual music symbols. A convolutional neural network built using the Keras library on a TensorFlow backend is used to identify the symbol. Once identified, the symbols are fed into a music notation model which will output a MIDI file.

Project Area: Software Development, Optical Character Recognition, Image Video Processing, Computer Vision
Project Technology: Python

Project Number: 39

Project Title: Person Re-identification on a Neural Compute Stick
Name: Zeynep Naz Tugrul
Email: zeynep.tugrul2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Kevin.McGuinness@dcu.ie

This project implements a person re-identification system using the Movidius Neural Compute Stick. The solution uses a convolutional neural network [CNN] for representation extraction on the device, and fast lookup techniques to determine if a person has been seen before by the system, and updates the system’s database accordingly. The project is developed using Python and the Caffe framework for the CNN.

Project Area: Image Video Processing, Embedded Systems, Computer Vision, Automation, Artificial Intelligence
Project Technology: Python
**Project Number: 40**

**Project Title:** Normality Test Analysis  
**Name:** Padraig McCahey  
**Email:** padraig.mccahey3@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Tamas.Szecsi@dcu.ie

Many six sigma statistical tools and procedures (such as ANOVA) are based on an underlying assumption that the data follows a normal distribution or a Gaussian distribution. Therefore, before these procedures and tools can be applied, it is essential for the data set to be tested in advance for normality. A number of these normality tests are used in this project. Their capabilities and limitations are analysed and compared.

**Project Area:** Statistical Analysis  
**Project Technology:** Excel/VB

---

**Project Number: 41**

**Project Title:** Unistart  
**Name:** Rupak Thapa  
**Email:** rupak.thapa2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Paul.M.Clarke@dcu.ie

My Project is a web based application. Which is student and lecturer portal. This website was built because I believe there should be better interaction between Students and Lecturers. Using this website the lecturer can take attendance and distribute class material like (exercise sheet). Lecturer can create an assignment with specific date and time. This portal allows the student to post anonymous question to lecturer and track their progress in an assignment. These are just few features.

**Project Area:** Web Application  
**Project Technology:** PHP, REST, XML, MySQL, JavaScript, HTML5

---

**Project Number: 42**

**Project Title:** The Internet of Things: A sensor fusion application using MATLAB and ThingSpeak  
**Name:** Robert Beirne  
**Email:** robert.beirne3@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Jennifer.Bruton@dcu.ie

Sensor fusion is the combination of multiple sensors to improve the performance of a system through the use of software-based methods. This project combines accelerometer and gyroscope data to perform sensor fusion using MATLAB software. The Kalman filter and Complementary filter sensor fusion models are applied to provide a real-time attitude estimation of the sensor system. The IoT platform ThingSpeak is also examined as a sensory data analysis tool in the cloud.

**Project Area:** Arduino, Control Systems, Data Analytics, Internet of Things, Sensor Data, Sensor Technology  
**Project Technology:** Matlab
**Project Number: 43**

**Project Title:** NFC-Capable Password Storage Application  
**Name:** Daniel Holton  
**Email:** daniel.holton2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Cathal.Gurrin@dcu.ie

The aim of this project is to create a password manager that will speed up initial use of a machine. The application allows a user to pull their login credentials, via an NFC device, from their personal machine and store them securely on their Android device. When the user moves to a new machine, they can send their credentials to it via an NFC device. The credentials will be populated in the login fields when they visit the relevant website.

**Project Area:** Android, Cryptography, Mobile App, Web Application  
**Project Technology:** SQLite, MySQL, JavaScript, Java

**Project Number: 44**

**Project Title:** Analysing the challenges faced with large scale renewable energy integration in Ireland  
**Name:** Conor Forde  
**Email:** conor.forde9@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** James.Carton@dcu.ie

This project provides analysis of the issues facing large-scale renewable energy integration in Ireland between 2020-2030. Renewable energy sources are expected to account for 60-70% of electricity generation by 2030. Specifically, the problem of curtailment of variable sources of electricity generation such as wind was examined. Using an Irish electricity system model developed by AB0 Wind Ireland, simulations were run for a 70% share of renewable electricity generation to estimate curtailments and various mitigation strategies were explored to reduce curtailment.

**Project Area:** Electric Generation, Renewable Energy Technology, Simulation  
**Project Technology:** Excel/VB

**Project Number: 45**

**Project Title:** ICOHub  
**Name:** Aaron Gillespie  
**Email:** aaron.gillespie6@mail.dcu.ie  
**Name:** Evan Doherty  
**Email:** evan.doherty38@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Cathal.Gurrin@dcu.ie

ICOHub is a unique and innovative investment platform that allows startup companies to launch an ICO token without any blockchain knowledge. ICOHub offers a package of services to investors allowing them invest in start-up company’s with ease.

**Project Area:** E-Commerce, Web Application  
**Project Technology:** CSS, HTML5, JavaScript, MySQL, PHP, Blockchain
Project Number: 46
Project Title: An augmented reality pedestrian navigation system
Name: John O Callaghan
Email: john.ocallaghan23@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Robert.Sadleir@dcu.ie

Augmented Reality combines virtual content with the real world to provide an enhanced perception of our reality. The reality explored in this project is someone struggling with the navigation of a complex indoor building. This project develops an Android application which adds virtual objects to aid in navigation of such environments.

Project Area: Android, Augmented Reality, Computer Vision, Image Video Processing, Mobile App
Project Technology: Java

Project Number: 47
Project Title: Development of a Probe Tack Experiment for Measuring the Adhesiveness of Biomaterials
Name: Mark Mc Donald
Email: mark.mcdonald72@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Garrett.McGuinness@dcu.ie

The primary objective of the project is measure the level of tack [stickiness] of pressure sensitive adhesives (PSA’s) that are used for wound care applications. The tack was measured using a probe tack test experimenting on surgical tapes and bandages that are found on the consumer market. The JKR theory was applied to the adhesive samples for comparison of the theoretical versus the actual results obtained. Finally, a standalone unit was designed to conduct the test on an individual’s forearm.

Project Area: Biomedical Engineering
Project Technology: Solidworks

Project Number: 48
Project Title: Confined Atmospheric Pulsed Laser Deposition
Name: Louis Ronan
Email: louis.ronan4@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Dermot.Brabazon@dcu.ie

Direct writing of electronic structures will be examined via the Confined Atmospheric Pulsed-laser deposition [CAP].

As nanotechnology has developed, the creation of nano-structured surfaces has garnered attention for their application in sensing and catalysis. These are however often expensive, time-consuming, and difficult to produce. In contrast, this investigation is focused on the inexpensive, environmentally friendly, and fast technique of Confined Atmospheric Pulsed-laser deposition by altering the process parameters with a view to optimise electronic structure deposition.

Project Area: Sensor Data
Project Technology: LabVIEW, Design Expert 7
### Project Number: 49

**Project Title:** Detecting brigading on social media with machine learning.  
**Name:** Adam Pegman  
**Email:** adam.pegman2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Ray.Walshe@dcu.ie  

This project is a social media bot to help people who have set up a community on Reddit prevent ‘brigades’ of users who belong to other communities from flooding the discussion. The bot collects a sample of comments from another community set by the user and trains a machine learning model, allowing it to detect and remove comments that are similar to the comments from the other community.

**Project Area:** Web Application, Social Networking, Databases, Data Mining, Model View Controller, Software Development  
**Project Technology:** CSS, HTML5, Java, SpringMVC, SQLite

### Project Number: 50

**Project Title:** Fuel Cell Storage  
**Name:** Maryam AlSaqry  
**Email:** maryam.alsaqry2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** James.Carton@dcu.ie

Hydrogen fuel cells are an attractive source of energy, as they are environmentally friendly and they produce energy with higher efficiency compared to batteries. Hydrogen can be produced in small quantities via the decomposition of water via a metal-water chemical reaction, the produced hydrogen can be employed to power fuel cells for portable applications. This project focuses on the selection of the finest metal for hydrogen production under suitable experimental parameters that are optimised using DOE methods.

**Project Area:** Energy Conservation  
**Project Technology:** DOE methods

### Project Number: 51

**Project Title:** Development and Characterisation of Braided Fibre Bundle Structures for Tendon Substitution  
**Name:** Greg Campion  
**Email:** greg.campion4@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Garrett.McGuinness@dcu.ie

A research & development based project that aims to develop an anterior cruciate ligament (ACL) prosthesis to eliminate the current issues surrounding ACL reconstruction surgeries. Polyvinyl alcohol (PVA), a highly biocompatible material, is used in a braided rope pattern in order to mimic the function of the native ACL. The research project assesses the mechanical behaviour of the braided structures in terms of their suitability for high-stress applications as an ACL prosthesis.

**Project Area:** Tissue Engineering, Biomedical Engineering  
**Project Technology:** Solidworks
Project Number: 52
Project Title: Notary of Digital Assets
Name: Anna Parisi-Ploumpi
Email: anna.parisiploumpi2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Geoff.Hamilton@dcu.ie

The idea behind this project was to solve the problem of trust between two or more signatories and a digital notary using cryptography. Using this application, the signatories can share, sign and safeguard a digital asset (which can be anything from a word document, to an mp3 file etc.) and the notary ensures that all digital assets entered into the system cannot be altered, disclosed without permission or have their associated transactions tampered with or repudiated by the signatories.

Project Area: Cryptography
Project Technology: .NET, C#, SQL

Project Number: 53
Project Title: Gaa Game Time Statistics
Name: Aisling Casserly
Email: aisling.casserly4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Roantree@dcu.ie

This application was developed to help improve a GAA team’s game play by recording their statistics during the game to highlight their strengths and weaknesses on the pitch. The user logs into an account on the mobile application and then begins to record the information about the match (kick outs/ scores/ turnovers). This information will then be displayed to the user in graph form allowing them to see where the teams strength and weaknesses are on the pitch.

Project Area: Android, Mobile App
Project Technology: React-Native, Node.js, SQLite

Project Number: 54
Project Title: Finite element modelling of damage and proposed repairs to the distal femur/Condyles
Name: Ross Gordon
Email: ross.gordon5@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Bryan.MacDonald@dcu.ie

This project will examine osteochondral defects on the medial femoral condyle and the stresses present in the defect. It will investigate the effect the size of an osteochondral defect has on the stresses present in a patient’s femur bone and use various scaffolds to repair the affected site. A 3D Finite Element Model composed of a standardised femur bone was created using ANSYS Workbench and SolidWorks to analyse and measure the various stresses and strains present in the distal femur.

Project Area: 3-D Modelling, Biomedical Engineering, Finite Element Analysis
Project Technology: ANSYS Workbench, Solidworks
Project Number: 55

Project Title: BluBox
Name: Barry O’Sullivan
Email: barry.osullivan29@mail.dcu.ie
Name: Seán O’Connor
Email: sean.oconnor93@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

BluBox is an ‘Internet of Things’ device aimed at medium to large recreational boats. Our vision is to create a greater connection between boats and their owners by creating a remote hub for all important onboard information. Data will be sent via a mobile or web application for instant use, analysis and sending of critical notifications. The purpose of our project is to innovatively improve a owners boating experience.

Project Area: Internet of Things
Project Technology: .NET, CSS, HTML5, Java, JavaScript, Node.js, JSON, NMEA, Ionic, Signal K, Autodesk Fusion 360, Raspberry Pi

Project Number: 56

Project Title: Source Code Analyser Engine
Name: Bernard O’Connor
Email: bernard.oconnor47@mail.dcu.ie
Programme: Computer Applications
Supervisor: David.Sinclair@dcu.ie

The aim of this platform is to create a library that will assist the promotion of best practice coding standards. This enables other developers to integrate it, either locally through the library or remotely through my cloud based web platform, into their own code teaching websites, IDE plugins, or other such projects.

The system, using a Java library written in Clojure, takes in a user submitted style-rulebook, the piece of source code, and returns suggested changes based off the rulebook.

Project Area: Cloud Computing, Software Development, Web Application
Project Technology: Clojure, ClojureScript, Leinigen, Figwheel, Jetty Server, Bootstrap, Compojure, CLJS-Ajax, Reagent, IntelliJ

Project Number: 57

Project Title: IoT Hub using JavaScript
Name: Seamus Doherty
Email: seamus.doherty27@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Martin.Collier@dcu.ie

Recently introduced IoT application boards, the Espruino and the Tessel 2 which both natively support JavaScript and Node.js hint at a new trend of the use of JavaScript in IoT development. This project involves the development of an IoT hub of sensors using the Espruino and the Tessel boards, bundled with a monitoring application. The performance of this solution is compared to that of a traditional approach using a compiled language, comparing footprint, power consumption, accessibility and development time.

Project Area: Sensor Data, Web Application
Project Technology: HTML5, JavaScript, Node.js
Project Number: 58
Project Title: Development of a Low Cost Plantar Pressure Measurement Device
Name: Graham Vaughey
Email: graham.vaughhey2@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Dermot.Brabazon@dcu.ie

Plantar pressure distribution, which is the pressure felt between the sole of the foot and a support surface, can be an important form of analysis in determining an illness and detecting lower limb problems. The aim of this project is to design and develop a low-cost device capable of measuring an individual’s plantar pressure during normal activity such as walking. The finalised device was assessed and compared to other systems already present on the market.

Project Area: Additive Manufacturing, Arduino, Biomedical Engineering
Project Technology: Solidworks

Project Number: 59
Project Title: Spotted
Name: Liam Nunez
Email: liam.nunez2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Ray.Walshe@dcu.ie

Spotted is a map based Android application. In summary, it allows users to make ‘posts’ which will be displayed on a map and can be viewed by other users near their area as well as encompassing a communication system which allows users to contact each other. These ‘posts’ may contain images, text or both. Useful for users in communities as they can advertise unwanted items for sale, report antisocial behaviour, report missing pets, ask the townspeople questions and so on.

Project Area: Mobile App, Android
Project Technology: Java

Project Number: 60
Project Title: MiPT
Name: Nathan McAloon
Email: nathan.mcaloon2@mail.dcu.ie
Name: Dillion Dooley
Email: dillion.dooley7@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jane.Kernan@dcu.ie

This web application is aimed at the health and fitness industry, and a growing market. Our application is designed for both personal trainers and their clients. Personal trainers can manage their time, their clients, view progress and distribute materials. Likewise, clients can log information and view material sent by the personal trainer. The aim of this app is to leverage their existing workflow with the aim of improving results. This Project utilizes HTML5, Javascript, PHP, CSS, & MySQL.

Project Area: Web Application
Project Technology: CSS, HTML5, JavaScript, MySQL, PHP, SQL
Project Number: 61

Project Title: Sound Generation and Mitigation in a water mill
Name: Neil Martin
Email: Neil.martin34@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Harold.Esmonde@dcu.ie

While a water mill system is running, sound generation from the system occurs. An unknown source in the system is causing the sound. With the use of an accelerometer, microphone and LabView this source can be determined. A form of sound mitigation will be implemented once the source has been identified. Soundproofing and vibration absorption are two of the mitigation techniques used to reduce the sound of the water mill system.

Project Area: Data Analytics, Device Design  
Project Technology: LabVIEW, Solidworks

Project Number: 62

Project Title: Diagnose Dyscalculia
Name: Méabh Horan
Email: meabh.horan4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

This project will consist of a mobile application which will act as a diagnostic tool for young primary school children who may possibly have dyscalculia. Dyscalculia is a maths learning disability which can effect a persons ability to learn arithmetic facts, process numerical magnitude and perform accurate and fluent calculations. The application will test young children through a set of various tasks/tests to determine if they have the learning difficulty.

Project Area: Android, Mobile App  
Project Technology: Java, SQLite, XML

Project Number: 63

Project Title: The Impact Of A Bottleneck On A Lean Manufacturing System
Name: Tobe Nwosu
Email: samuel.nwusutobechukwu2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: John.Geraghty@dcu.ie

This project investigates the impact of a processing time bottleneck on four-stage, single product Kanban and CONWIP systems. The effect of a constraint on the stability of system work-in-progress (WIP) and service level is analysed while monitoring the amount of backlog recorded. It also explores bottleneck mitigation methods such as adjusting the WIP restriction placed on the four stages of the Kanban system and adding extra WIP to the Kanban and CONWIP systems when a bottleneck is detected.

Project Area: Lean Manufacturing  
Project Technology: ExtendSIM
**Project Number: 64**

**Project Title:** NFC Receipts App  
**Name:** Emer Hennebry  
**Email:** emer.hennebry2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Jane.Kernan@dcu.ie

This is an Android application which gathers in-store receipts from Near Field Communication (NFC) tags. Once the receipt is scanned, users can view their receipts through the app. The app's aim is to provide a simple way to organise and budget purchases by supplying an overall calculation of all their expenditure, categorising their receipts into different folders and providing suggestions of shops they may like.

**Project Area:** Android, Mobile App  
**Project Technology:** Java, SQLite, XML, NFC

---

**Project Number: 65**

**Project Title:** Cerberus MapReduce Framework  
**Name:** Darragh Griffin  
**Email:** darragh.griffin24@mail.dcu.ie  
**Name:** Ryan Connell  
**Email:** ryan.connell5@mail.dcu.ie  
**Name:** Conor Griffin  
**Email:** conor.griffin37@mail.dcu.ie  
**Programme:** Computational Problem Solving and Software Development  
**Supervisor:** David.Gray@dcu.ie

Cerberus is a MapReduce framework built for processing large datasets across many machines. The framework is written in Rust and is focused on reliability and scalability. The project includes a distributed filesystem implementation which can be used for storing datasets distributed across the machines carrying out the MapReduce. Other storage implementations are included with the framework including an implementation for using S3 on AWS.

**Project Area:** Cloud Computing, Distributed Systems  
**Project Technology:** Rust, Docker

---

**Project Number: 66**

**Project Title:** Performance Monitoring of Lithium Ion Cells.  
**Name:** Sean Finn  
**Email:** sean.finn32@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Barry.McMullin@dcu.ie

This project detailed and explored the performance of a lithium-ion battery. A methodology to establish singular cell state of health within an overall battery pack using elements of the charge cycle was proposed. Using a simple test rig, Arduino and Matlab, a monitoring station was created to capture and graphically present the behaviour of a lithium-ion battery. The state of health was determined from the slope of the charge cycle constant-current phase and a look-up table.

**Project Area:** Arduino, Renewable Energy Technology, Sensor Data  
**Project Technology:** C/C++, Matlab
**Project Number: 67**

**Project Title:** CoderDojo Zen Projects  
**Name:** Graham Bartley  
**Email:** graham.bartley3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Geoff.Hamilton@dcu.ie

This project aims to build a project creation, management and interaction solution for the CoderDojo Foundation and their community platform (Zen) which is currently used to manage over 1,000 Dojos and their events across the world. This solution allows youths to share software projects they have worked on by uploading their code which is automatically stored and versioned using GitHub. Projects can then be run and interacted with directly in the browser including Python 3, Node.js, HTML5 and Java projects.

**Project Area:** Content Management System, Web Application  
**Project Technology:** CSS, Docker, HTML5, SQL, Vue.js, Node.js

**Project Number: 68**

**Project Title:** Experimental and Numerical Investigation of the Rubber-Pad Forming Process of Aircraft Components  
**Name:** Peter Hogan  
**Email:** peter.hogan8@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Bryan.MacDonald@dcu.ie

The project investigates the rubber-pad forming manufacturing process of a hemi-spherical dome shape. The investigation included both experimental and finite element methods using Ansys software. A three-dimensional model was produced in order to compare with the experimental results. The project involved variance the forming load, lubrication conditions and equipment set-up which produced results including maximum forming depth, areas of high stress and defect prevention.

**Project Area:** Finite Element Analysis  
**Project Technology:** ANSYS Workbench, Solidworks

**Project Number: 69**

**Project Title:** Developments of a Digital Twin for the FMS Rig  
**Name:** Jake Salveta  
**Email:** jake.salveta2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Paul.Young@dcu.ie

This project aimed at upgrading the control systems which would enable communication from the PLC’s over the network, in order to make it in line with industry 4.0. Before this could happen problems had to be resolved with the station that was going to be worked on. These issues were resolved using Siemens Step 7 products and configuring the station efficiently.

**Project Area:** Automation  
**Project Technology:** Siemens Step 7 Products, Solidworks
**Project Number: 70**

**Project Title:** Automatic Fashion Item Identification and Classification using Deep Learning based Computer Vision  
**Name:** Sakthignana Sundaram Somaskandan  
**Email:** sakthignana.somaskandan2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Paul.Whelan@dcu.ie

This project involves the design and implementation of a convolutional based neural network which is capable of recognizing a limited set of fashion items from everyday images. The main goal is to develop a system that is computationally efficient as well as accurate in predicting a fashion item given an image. It also involves the analysis of transfer learning from industry level models.

**Project Area:** Artificial Intelligence, Computer Vision  
**Project Technology:** Python

---

**Project Number: 71**

**Project Title:** User Behaviour Monitoring  
**Name:** Elisabeth Kraman  
**Email:** elisabeth.kraman2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Brian.Stone@dcu.ie

The project tracks near real-time user behaviour to ensure the business understands their product performance – focusing on VSWare use case. It provides a general overview of user interactions with a VSWare application. This is achieved through a Big Data Platform and analytics which are computed in a distributed manner by Spark Cluster. User behaviour anomaly detection demonstrates the platform’s Machine Learning potential. General analytics are displayed on a web based UI.

**Project Area:** Databases, Data Mining, Data Analytics  
**Project Technology:** AWS Kinesis, Apache Spark (Streaming & MLlib), Apache Cassandra, Chef Cookbooks, Jenkins, JUnit, SonarQube, Vue.js, Java

---

**Project Number: 72**

**Project Title:** Re-Enforcing Nano-Particle Integration into Metal AM and Produced Part Characterisation  
**Name:** Ahmed Mohd Ahameed  
**Email:** ahmed.ahameed2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Dermot.Brabazon@dcu.ie

In this project, reinforcing phases of elements of nano-scale SiC particles was integrated within Additive Manufacturing 316L stainless steel powder. Correlation of production parameters using Powder Metallurgy route, amount of the reinforcement phase and resultant part’s mechanical and microstructural properties were examined for process optimization. Nano-material characterization techniques for this project included SEM, advanced Optical Microscopy, and Particle Surface Analysis.

**Project Area:** Advanced Material Engineering, Mechanical Design and Manufacture, Additive Manufacturing  
**Project Technology:** Powder Metallurgy
Project Number: 73
Project Title: WhichPrep
Name: Ellen Kennedy
Email: ellen.kennedy38@mail.dcu.ie
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

WhichPrep is an Android application designed to assist English learners to correctly use prepositions. The app offers sentences of varying length and content to the user with the prepositions missing. The user selects the correct preposition from a selection of possible answers. This process increases in difficulty as the user completes levels to allow the user to apply their learning. A MySQL database communicates with the main application to provide sentences suitable for the user’s current level.

Project Area: Mobile App, Educational, Android, Databases
Project Technology: SQL, MySQL, Java

Project Number: 74
Project Title: Assessment of injectability of hydrogels designed for bone repair applications
Name: Yi Nan
Email: yi.nan3@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

This project investigates the injectability of Alginate hydrogel. Forces required for the injection of Alginate hydrogel of different compositions were evaluated using a 5kN Zwick mechanical testing machine. The curing process was also examined with a Rheometer, the gelation time of hydrogel samples was also assessed using the data acquired.

Project Area: Tissue Engineering
Project Technology: AntonPaar Rheometer Software

Project Number: 75
Project Title: Styled Solutions
Name: Shauna Barry
Email: shauna.barry32@mail.dcu.ie
Name: Roisin Crowley
Email: roisin.crowley7@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Markus.Helfert@dcu.ie

Styled Solutions is a customer relationship management system that will help manage a salon’s relationship and interactions with their customers and potential customers. The website will manage bookings which will help salons to increase their profitability and work flow processes. Styled solutions acts as a platform for salons to advertise their business helping to generate new clients to maximise business potential.

Project Area: Web Application, Databases
Project Technology: Java, JavaScript, MySQL, PHP, SQL, HTML5
Project Number:  76

Project Title:       ASDN - Automated Software defined Networking  
Name:               Filip Nikolic  
Email:              filip.nikolic2@mail.dcu.ie  
Programme:         Computer Applications  
Supervisor:        Brian.Stone@dcu.ie

This is a network automation platform which will aid engineers in deploying and maintaining a live network. It will subsequently reduce operating costs as well as likelihood of human introduced errors. The devices this platform will manage include, but are not limited to enterprise grade switches, routers and firewalls. The system will use a variety of technologies, including a client-server architecture, Statistical Machine Learning, Software Defined Networking tools and many other.

Project Area:  Network Applications  
Project Technology: AngularJS, CSS, HTML5, Java, JavaScript, JQuery, MySQL, Python, SpringMVC

---

Project Number:  77

Project Title:       Stability Analysis of Compensated Voltage Regulators  
Name:               Aoife Grady  
Email:              aoiife.grady2@mail.dcu.ie  
Programme:         Electronic and Computer Engineering  
Supervisor:        Marissa.Condon@dcu.ie

This project investigates suitable compensators for use in buck converter systems. DC-DC converters are widely used in equipment for computing, mobile and automotive applications. Nowadays DC-DC design requirements are increasing due to a market demand for smaller size and higher efficiencies. The project investigates the selection of suitable compensators to achieve a desired performance and a well-regulated voltage.

Project Area:  Circuit Modeling, Control Systems, Mechatronic Systems, Power Electronics, Simulation  
Project Technology: Matlab, Simulink

---

Project Number:  78

Project Title:       Sensor fusion based indoor positioning system  
Name:               Adráin Whelan  
Email:              adrain.whelan38@mail.dcu.ie  
Programme:         Electronic and Computer Engineering  
Supervisor:        Robert.Sadleir@dcu.ie

Sensor fusion is the combination of sensor readings to enhance system performance. This project investigates the use of sensor fusion in relation to smartphone sensors and other data sources usable within infrastructures e.g. Wi-Fi, to develop an indoor navigational device that can provide a rough indication of position. Different localization strategies were developed throughout this project and were evaluated in terms of accuracy, performance and resource usage, by comparing the device’s outputs against ground truth data specified within this project.

Project Area:  Android, Mobile App, Sensor Data  
Project Technology: Java, XML
Project Number: 79

Project Title: Design and build a new pumping station for microbubble generation
Name: Ciaran Gibney
Email: ciaran.gibney4@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Yan.Delaure@dcu.ie

The objective of this project is to design a frame to increase the oxygen transfer rate of a micro-bubble diffuser. The frame design created a viscous shear flow over the diffuser which has been shown to increase the detachment rate of microbubbles. The venturi effect was investigated through the CFD ANSYS programme fluent, then implemented into the flow chamber design. In turn, maintaining the high oxygen transfer rate but reducing the volumetric flow demand.

Project Area: Fluid Mechanics, Water Treatment
Project Technology: Solidworks, ANSYS Workbench

Project Number: 80

Project Title: C-Me
Name: Kevin Nangle
Email: kevin.nangle2@mail.dcu.ie
Name: Seán Motherway
Email: sean.motherway4@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Brian.Stone@dcu.ie

C-Me is a mobile application that helps groups of friends organise and locate each other during social events. This app allows friends to plan a social event by providing the event details and inviting their friends to the event. As the start-time of the event approaches the location of all invited guests will be shared amongst each other and everyone’s location will be visible on a virtual-map. Allowing users to track and locate their friend’s before and during social events.

Project Area: Android, Cloud Computing, Databases, Mobile App, Social Networking
Project Technology: Java, XML

Project Number: 81

Project Title: Guild Wars 2 Companion App
Name: Brendan McManus
Email: brendan.mcmmanus7@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

This project will allow players of the game Guild Wars 2 to access their account outside of the game, as well as see the in-game, player run, trading post. From this they will be able to view all the details of their account in a comprehensible format that would be normally hidden within menus. They will also be able to view predicted prices of items on the trading post.

Project Area: Web Application
Project Technology: AngularJS, Java, JavaScript, Python
### Project Number: 82
**Project Title:** Adjustable damper for external door  
**Name:** Robert Ennis  
**Email:** robert.ennis2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Alan.Kennedy@dcu.ie

This project investigates the operating force required to open and close a door. A simple controllable damper which represents a hydraulic door closer was designed to measure the force required by a spring or counter-weight to close a door and the force required by the user to open it. The objective of the project was to reduce both forces to as little as possible. A redesign of an existing counter-weight door mechanism was also designed.

**Project Area:** Mechanical Design and Manufacture, Simulation  
**Project Technology:** Matlab, Simulink, Solidworks

### Project Number: 83
**Project Title:** Development of a Degradable Embolic Hydrogel Material for the Temporary Embolization of Liver Tumours  
**Name:** Matthew McDermott  
**Email:** matthew.mcdermott32@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Owen.Clarkin@dcu.ie

The objective of this project is to develop a degradable sodium alginate based hydrogel for the temporary embolization of the hepatic artery to treat liver tumours. Calcium carbonate – glucono delta lactone-based formulations are being developed for this purpose. Various testing methods will be performed on the hydrogel samples to determine the optimum formulation. Tests to determine working and setting times, degradation behaviour, injectability and compressive strength will be performed.

**Project Area:** Biomedical Engineering, Tissue Engineering  
**Project Technology:** Excel/VB

### Project Number: 84
**Project Title:** Software Configurable Hardware Architectures for Machine Vision Algorithms Implemented on Zynq  
**Name:** Mark McHugh  
**Email:** mark.mchugh32@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Derek.Molloy@dcu.ie

The use of embedded machine vision for IoT applications is currently experiencing huge expansion. To facilitate this type of growth in the age of IoT and post Moore’s law era innovative solutions are needed that minimise power consumption and maximise computing resources. In this project a framework is developed for accelerating computationally expensive tasks in Hardware-Software Co-Design image processing pipelines using the Zynq APSoC and High Level Synthesis.

**Project Area:** Internet of Things, Computer Vision, Embedded Systems  
**Project Technology:** C/C++, FPGA
Project Number: 85

Project Title: 3D Printing of Calcium Phosphate Based Scaffolds
Name: Seán Elliott
Email: sean.elliott5@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Nicholas.Dunne@dcu.ie

This project investigates the validation of a pre-built FDM based 3D printer’s ability to produce accurate and precise calcium phosphate-based scaffolds and the modifications required for the printer to be repurposed in order to achieve this.

Project Area: 3-D Modelling, Additive Manufacturing, Biomedical Engineering, Tissue Engineering
Project Technology: Solidworks

Project Number: 86

Project Title: TrackMyDiabetes
Name: Alannah McCabe
Email: alannah.mccabe38@mail.dcu.ie
Name: Sarah Kelly
Email: sarah.kelly247@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

TrackMyDiabetes is an application that was developed to assist people with diabetes with the monitoring of data crucial to their diabetic health management. It engages with the API of Fitbit and MyFitnessPal to automatically record and integrate the user’s exercise and diet data. The application also allows users to enter their blood glucose levels and then uses all of the information given to provide a recommended insulin bolus dosage to the user.

Project Area: Web Application
Project Technology: CSS, HTML5, JavaScript, MySQL, PHP

Project Number: 87

Project Title: PiMirror
Name: Kieran Turgoose
Email: kieran.turgoose2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

This project is a Raspberry Pi powered Smart Mirror, with an accompanying Android application. The Mirror showcases a collection of user-specific widgets on-screen that can be configured manually through the app. Facial Recognition is used to change the on-screen interface depending on the user that is standing in-front of the Mirror. The aim of this project is to provide a practical and useful interface for daily life, to lend a helping hand while the user prepares for their day.

Project Technology: HTML5, Java, JavaScript, Node.js, Python, XML, OpenCV, SSH
Project Number: 88

Project Title: Modelling and Analysis of Closed Loop Supply Chain Management for Reusable Articles

Name: Jack Keogh
Email: jack.keogh23@mail.dcu.ie
Programme: Manufacturing Engineering with Business
Supervisor: John.Geraghty@dcu.ie

Closed-Loop Supply Chains have a unique set of management issues due to the added complexity of their cyclical nature. Reusable Articles are the key items within these systems that serve their purpose numerous times throughout their life cycle. This project, founded on an SME case study, explores the use of Discrete Event Simulation as a management tool for these particular systems; focusing on the ancillary item of the keg for a brewery operation.

Project Area: GPS GIS, Lean Manufacturing, Simulation, Statistical Analysis
Project Technology: ExtendSIM

Project Number: 89

Project Title: Neural Jump

Name: Christopher Durning
Email: christopher.durning4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Paul.M.Clarke@dcu.ie

This project demonstrates how genetic theory and neural networks can be used to solve computer problems. The NEAT [Neural Evolution of Augmented Topologies] algorithm I have implemented outperforms the best fixed topology methods on benchmark reinforcement learning challenges. To showcase the algorithm, I created a 2-D arcade game using the Unity 5 engine. The algorithm learns how to play the game with no previous knowledge on how the game works.

Project Area: Artificial Intelligence, Gaming
Project Technology: C#, Unity

Project Number: 90

Project Title: Development of Scaffolds for Tissue Engineering Applications with Optimized Porosity and Mechanical Properties.

Name: Peter Cullen
Email: peter.cullen6@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Nicholas.Dunne@dcu.ie

The worldwide incidence of non-union bone fractures has trended steeply upwards continues to rise. Dependable synthetic bone scaffolds would remove the need for bone harvest operations, which are necessary in autograft procedures.

For bone in-growth to occur, a scaffold must be sufficiently porous and have the necessary compressive strength for load bearing in vivo. Scaffolds were produced via the foam replication technique using hydroxyapatite and beta-tricalcium phosphate. Testing was carried out to determine scaffold porosity and compressive strength.

Project Area: Advanced Material Engineering, Biomedical Engineering, Tissue Engineering
Project Technology: Excel/VB
Project Number: 91
Project Title: Delicious
Name: Daniel Cahill
Email: daniel.cahill8@mail.dcu.ie
Name: Shane Rooney
Email: shane.rooney28@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jennifer.Foster@dcu.ie

Delicious is a deli pre-ordering system accessed through two web applications. The first allows customers to select their desired item from the full menus provided by stores along with their preferred collection time and any additional preparation notes they require. The second allows the deli staff to manage the orders. This system saves both the customer and deli staff time during their busy days, making the process of purchasing from deli and hot food counters more efficient, modern and painless.

Project Area: Web Application
Project Technology: JavaScript

Project Number: 92
Project Title: Production and inventory control strategies for systems manufacturing perishable goods
Name: David Kilbridge
Email: david.kilbridge4@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: John.Geraghty@dcu.ie

Assess experimentally the impact of perishability of the effectiveness and efficiency of modern production and inventory control strategies for lean manufacturing systems. Within the project must contain a state-of-the-art review of production and inventory control for lean systems and for impact of perishability on line management performance, a discrete event simulation model on ExtendSim to provide the experimental platform and a conducted design of experiments analysis of the effect of perishability on selected production and inventory control strategies.

Project Area: Lean Manufacturing
Project Technology: ExtendSIM

Project Number: 93
Project Title: Jobder
Name: Adrian James Rabbitt
Email: adrian.rabbitt3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

The Android application Jobder is a virtual Employment system for all fields and skills of work. The system captures the user’s data including their GPS data, targeting instant events and real time posting’s. The data is filtered and displayed according to the user’s field of employment and user needs using google maps API. The application also includes instant messaging, geocoding and automatic grammar correction. There is a web application where users can view statistical information of different trends of employment.

Project Technology: AngularJS, CSS, Docker, HTML5, Java, JavaScript, Node.js, NoSQL, PHP, XML
Project Number: 94

Project Title: An investigation of a MATLAB simulation environment for multi-agent mobot path planning
Name: Seamus Stone
Email: seamus.stone6@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Jennifer.Bruton@dcu.ie

Creating an environment to visualize the progression of the path planning algorithms for robot movement whilst not compromising the computation speed of the algorithms is challenging. This project aimed to overcome this challenge by developing, designing, and building a robust path planning program capable of simulating multiple algorithms, and portraying their visual aspects while remaining entirely computationally efficient. The program successfully overcame this challenge through efficient programming and integration of an easy to use graphical user interface.

Project Area: Robotics, Simulation, Software Development
Project Technology: Matlab, GUI, Programming, Robot Path Planning

Project Number: 95

Project Title: Tuned Amplifier Simulation and Study
Name: Basim Humaid Al Dhawi
Email: basim.aldhawi2@dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Marissa.Condon@dcu.ie

The target of this project is to simulate a tuned amplifier that is working for high frequency application. The project examines how the non-idealities of components affect the results as frequencies rise. The project assesses what non-idealities need to be included in models to obtain accurate results.

Project Area: Circuit Modeling
Project Technology: MATLAB + PSpice

Project Number: 96

Project Title: Swift
Name: Stephen Heerey
Email: stephen.heerey2@mail.dcu.ie
Name: Darren Clarke
Email: darren.clarke43@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Monica.Ward@dcu.ie

Swift is a sports management app that removes the headaches of being a coach. It gives a platform for coaches and players, in a team, to share training data and communicate about upcoming events. Data is analysed and then displayed so the coach can discover areas of weakness and players can see how they are performing, relative to the team. Swift is an android app built with JAVA technology, with data stored and mined in a MySQL database.

Project Area: Mobile App, Data Analytics
Project Technology: MySQL, PHP, Java
Project Number: 97
Project Title: Haptic Feedback for Light Aircraft Flight Condition Awareness
Name: Adam Kiely
Email: adam.kiely5@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Noel.Murphy@dcu.ie

This project explores the introduction of haptics into aircraft cockpits. Visual and auditory cues are the primary source of pilot alerts. Research has shown that haptic feedback can significantly reduce response times to stimuli. The project uses flight simulation software in the development of three wireless (Zigbee) wearable devices. The devices use vibrations to alert the pilot to angle-of-attack and slip characteristics. Research experiments were carried out to further examine human reaction times to differing stimuli (visual, auditory & haptic).

Project Area: Simulation, Wireless Technology
Project Technology: C/C++, C#, Unity

Project Number: 98
Project Title: Development of Enhanced Fixation Techniques for Bio-Material Devices for Cartilage Repair
Name: Scott Byrne
Email: Scott.byrne93@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

Tissue engineered scaffolds aim to regenerate diseased or damaged tissue. However, translating them into clinical use is problematic, particularly the stable fixation of these devices within a cartilage defect. The challenging loading environment within the joint can lead to the failure of the device. This project investigates possible fixation device concepts, choosing a technique based on previous studies and determining if the final design can surpass the standard set previously by fixation techniques on the market.

Project Area: Biomedical Engineering
Project Technology: ANSYS Workbench, Solidworks, CES EduPack

Project Number: 99
Project Title: MySpy
Name: Denis Atkinson
Email: denis.atkinson6@mail.dcu.ie
Programme: Computer Applications
Supervisor: David.Sinclair@dcu.ie

This project consists of a home security system which communicates with an android application. The system consists of multiple internet protocol cameras and wireless sensor nodes both being monitored by a raspberry pi. The raspberry pi was chosen as the central controller and Zigbee nodes implementing XBee were chosen to communicate sensor readings to it.

Project Area: Android, Arduino, Databases, Internet of Things, Motion Analysis, RaspberryPi, Sensor Data, Software Development
Project Technology: Java, MySQL, PHP, Zigbee
**Project Number: 100**

**Project Title:** Designing and building a self-balancing ball-bot  
**Name:** Egidijus Ambrakaitis  
**Email:** egidijus.ambrakaitis2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Noel.Murphy@dcu.ie

A ball-bot is a mobile robot that is designed to balance on a spherical ball. The balancing is achieved by using embedded microcontroller and gyroscope sensors to precisely drive three DC motors. The aim of the project is to research, design and build a ball-bot and a method for self-balancing control.

**Project Area:** 3-D Modelling, Automation, Mechanical Design and Manufacture, Mechatronic Systems, Motion Analysis, Robotics  
**Project Technology:** C/C++, Solidworks

**Project Number: 101**

**Project Title:** SaorSchool  
**Name:** Dale Stewart  
**Email:** dale.stewart4@mail.dcu.ie  
**Name:** Shaun Ó Donnagáin  
**Email:** shaun.odonnagain2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Monica.Ward@dcu.ie

SaorSchool is a teacher to parent communication application for primary school level that will create a more relevant mode of communication between both parties, while also aiming to reduce a schools waste on physical resources. The app will allow teachers to communicate details of, an upcoming school event, a child’s academic performance issue, create virtual permission slips for parents to sign and more. Parents can conveniently access this information along with the ability to virtually sign a permission slip.

**Project Area:** Web Application  
**Project Technology:** PHP, SQL, Bootstrap, MySQL, JavaScript, HTML5, CSS

**Project Number: 102**

**Project Title:** Analyzing Online User Behaviour  
**Name:** Rachel Solomon  
**Email:** rachel.solomon2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Suzanne.Little@dcu.ie

The aim of this project is to contrast user behaviour on Reddit. It is a web application that performs statistical/sentiment analysis to portray a clearer insight into users’ behaviour and interactions within the different subforums of Reddit. It also outlines particular types of language which influences a comment to receive a higher score i.e. aggressive/assertive. There is an aspect of machine learning involved, incorporating predictive modelling to train a model to predict Subreddit/Score of a comment.

**Project Area:** Data Analytics, Natural Language Processing, Statistical Analysis, Web Application  
**Project Technology:** Python, JavaScript, CSS, SQLite
Project Number: 103
Project Title: Applying Arbitrage Techniques to Online Retail Platforms
Name: Sean Matthew Ladrigan
Email: sean.ladrigan2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Markus.Helfert@dcu.ie

The aim of this project is to give a user the ability to find the cheapest online market to buy a software key before selling it on another website at the highest possible price. By applying the basic arbitrage technique of “Buy low, sell high”, the user should be able to capitalise on the variations of product prices across multiple e-commerce platforms.

Project Area: Web Application
Project Technology: Python, SQL, Django, Bootstrap

Project Number: 104
Project Title: Finite Element Analysis of Simple Snap-Fits
Name: Shane Hudson
Email: shane.hudson2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Bryan.MacDonald@dcu.ie

Snap-fit connectors are widely used in product design. Some examples include rucksacks, various toys and safety syringes. The objective of this project is to first build and solve a finite element model of a simple snap-fit connection using ANSYS Workbench finite element software. This model was built and validated against experimental and theoretical data. The geometry of the snap-fit was then optimised using parametric design analysis.

Project Area: Finite Element Analysis
Project Technology: ANSYS Workbench

Project Number: 105
Project Title: Study of a Si based modulator
Name: MAADH HAMED SALIM ALNAABI
Email: maadh.alnaabi2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Pascal.Landais@dcu.ie

The aim of this project is to design an optical modulator based on CMOS circuit to study the Si based modulator. The design has to be simulated in the electrical properties of the waveguide, to determine carrier concentration of P-N junction, and the optical properties aspect to show how to modulate the phase by controlling the change of the reflective index via carrier concentration. High speed silicon Mach-Zehnder modulator was chosen to be designed for the project proposal.

Project Area: Optical Communications
Project Technology: MATLAB
**Project Number: 106**

**Project Title:** Monitour  
**Name:** Neil Geoghegan  
**Email:** neil.geoghegan4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Sinclair@dcu.ie  

A portable application aimed at giving teachers peace of mind when travelling on school tours. This monitors student activity and in the case of a student straying a group, notifies the teacher. Each teacher has their own device that connects to a cluster of wristbands worn by the students. Students can be monitored as a whole group or in subgroups. Subgroups can be created and disbanded dynamically while on a trip.

**Project Area:** Internet of Things, RaspberryPi, Wearable Technology, Wireless Technology  
**Project Technology:** JavaScript, Clojure, ReactJs, REST, Node.js, MongoDB  

---

**Project Number: 107**

**Project Title:** Passive radar based intruder detection  
**Name:** Steven Flynn  
**Email:** steven.flynn27@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Conor.Brennan@dcu.ie  

This project involves the design and implementation of a home monitoring system based on passive radar. For this project, I used several XBee chips communicating wirelessly with each other in a self-healing mesh network configuration. I then programmed an Arduino with an Xbee shield and RF chip to act as the brains of the system. The Arduino can accept, save and track information fed to it by the network.

**Project Area:** Arduino, Embedded Systems, Wireless Technology  
**Project Technology:** X-CTU, XBee  

---

**Project Number: 108**

**Project Title:** Scout Ahead  
**Name:** Finnian O’Neill  
**Email:** finnian.oneill27@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Stephen.Blott@dcu.ie  

Scout Ahead is a planning tool focused at hiking groups and scout groups that uses open source mapping data and transport information to give users a single space to gather all the information they require before heading out on the mountains.

**Project Area:** GPS GIS, Web Application  
**Project Technology:** HTML5, JavaScript, OpenGL, CSS
Project Number: 109

Project Title: Statistical Analysis and Improvement of Multiple High-Speed Assembly Cells through Lean and Six Sigma.

Name: Stephen Bradley
Email: Stephen.Bradley8@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Jeremiah.Murphy@dcu.ie

The aim of this project was to analyse and improve the baseline production performances of three high-speed assembly cells, located in Nypro Healthcare’s Bray site, currently experiencing significant volumes of mechanical faults and component blockages. Throughout the project, multiple lean and six sigma methodologies were utilised to effectively resolve these faults by developing and testing practical and efficient improvement solutions. Metrology analysis of assembly components and evaluation of injection moulding process conditions played a significant role in developing these solutions.

Project Area: Advanced Material Engineering, Automation, Data Analytics, Lean Manufacturing, Statistical Analysis
Project Technology: Solidworks

---

Project Number: 110

Project Title: Ultimate Frisbee Tournament Organiser

Name: Andrew Twohig
Email: andrew.twohig3@mail.dcu.ie
Programme: Computer Applications
Supervisor: Martin.Crane@dcu.ie

This app allows Tournament Directors to set up and run Ultimate Frisbee Tournaments. It allows them to automatically generate a bracket that conforms to the style of the tournament they want to run. This bracket is populated with the teams entered into the tournament. While the tournament is run Teams or Tournament Directors can enter results updating the bracket. This project used an Angular frontend with a REST API backend.

Project Area: Web Application
Project Technology: AngularJS, JavaScript, MongoDB, Node.js, REST

---

Project Number: 111

Project Title: Scaling in Internet of Things Networking

Name: Dylan Redmond
Email: dylan.redmond25@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: jennifer.mcmanis@dcu.ie

IoT networking architectures typically encompass a number of networking technologies working together to transport appropriate data.

This project requires the development of a suitable IoT Network Architecture and simulation model and then use of the the model to investigate how many end devices may be supported and where bottlenecks and Quality of Service (QoS) issues arise within the architecture.

Project Area: Internet of Things, Network Applications, Simulation
Project Technology: C/C++, Eclipse, NS-3, Python
Project Number: 112

Project Title: Simpli-Fi
Name: Adam Kelly
Email: adam.kelly256@mail.dcu.ie
Name: Pawel Olkowicz
Email: pawel.olkowicz2f@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Brian.Stone@dcu.ie

Simpli-Fi is a mobile application that aims to give parents more control over their children’s Wi-Fi access & app usage. Using the Simpli-Fi mobile app, parents can easily disable Wi-Fi access on their child’s device for any time period they choose. Parents can also block access to specific apps on the child’s smart device and even view the current location of their child. Simpli-Fi also brings a modern disciplinary technique to parents in a family household.

Project Area: Mobile App, Android
Project Technology: Java, MySQL, PHP

Project Number: 113

Project Title: Social Ride
Name: Pauric McGroarty
Email: pauric.mcgroarty3@mail.dcu.ie
Name: Muhamed Sabic
Email: muhamed.sabic2@mail.dcu.ie
Name: Cian Farrell
Email: cian.farrell58@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

This project aims to allow users to connect with one another based on lifestyle, common interests and most importantly - journey route. The journey may include a simple commute to work/university or it may even appeal to those seeking an adventure. No matter the destination, a suitable match can be found. Users can look for matches with the aim of networking, dating or simply building friendships. The possibilities are endless and our app is the platform to deliver them.

Project Area: Software Development, Social Networking, Web Application
Project Technology: CSS, HTML5, MySQL, PHP, SQL

Project Number: 114

Project Title: Hybrid Turbine Electrolyser
Name: Jochelle Laguipo
Email: jochelle.laguipo2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: James.Carton@dcu.ie

Wind energy is not as great as you think it is! Let’s make hydrogen. Hybrid Turbine Electrolyser is a project that critically examines, evaluates and highlights the problems associated with wind power for electricity generation, especially in Ireland. The identified inefficiencies are used to generate improvements by using wasted energy and converting it to storable hydrogen. This project includes the study of existing wind to hydrogen hybrid (power-to-gas) systems, and proposes a new energy system.

Project Area: Electric Generation, Energy Conservation, Renewable Energy Technology
Project Technology: Research
Project Number: 115
Project Title: Improved Drivetrain for Greenpower Car
Name: Rian John Molloy
Email: rian.molloy9@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Paul.Young@dcu.ie

To Design and build a Drivetrain capable of being implemented in the electric racing car series, F24 run by Greenpower. The mechanism was to be designed using SolidWorks and built with a variety of manufacturing processes including 3D printing. The aim of the new drivetrain is to improve efficiency and speed.

Project Area: Mechanical Design and Manufacture, Automotive Technology, 3-D Modelling
Project Technology: Solidworks

Project Number: 116
Project Title: GetGoing
Name: Talah Ishfaq
Email: talah.ishfaq2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Markus.Helfert@dcu.ie

A platform for people to organise events from start to finish. You can organise all the resources required for an event. Businesses and people with resources can offer them on the platform. Just fill out the details of the ideal event and the platform would generate the most suited package. A new random event package or individual resource can be requested if the user is not happy with the one generated. Mostly everything is done through the platform.

Project Area: Web Application
Project Technology: Node.js, Angular, HTML, CSS, Mongodb, JavaScript

Project Number: 117
Project Title: Design, Build and Test a Liquid Metal Strain Gauge
Name: Lucas Santos
Email: lucas.santos2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Jeremiah.Murphy@dcu.ie

Soft robotics is a subset of robotics with particular focus on flexible materials. Conventional strain gauges have a variety of industrial applications with particular emphasis on testing and validation of emerging products. This project explores the possibility of incorporating liquid metal into a silicone backing material for use as strain gauge in soft robotics applications focusing primarily on the manufacturing and design process.

Project Area: Mechanical Design and Manufacture, Robotics, Sensor Technology
Project Technology: Solidworks, Research
### Project Number: 118

**Project Title:** Simulation of Differing Forms of Economic Governance  
**Name:** Aaron Edgeworth  
**Email:** aaron.edgeworth3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Liam.Tuohey@dcu.ie

This project aims to simulate certain types of simple societies. It provides reliable and readable feedback for the use in social and economic studies. The project uses an agent based form of simulation to create a complex system that reflects a simple society. Differing forms of taxation and governance affect the function of the agents, with statistical feedback being produced to help make conclusions about the affects of the differing governments.

**Project Area:** Simulation, Software Development  
**Project Technology:** Unity, C#

### Project Number: 119

**Project Title:** CAN Bus Test-Bed and Messaging Interface in Matlab  
**Name:** Carolyn Crampton  
**Email:** carolyn.crampton2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Jennifer.Bruton@dcu.ie

The aims of the project are to investigate the Controller Area Network (CAN) Bus communication protocol, to design a platform to test this communication, and to develop a user-friendly messaging interface which “translates” the CAN communication using Matlab. This project demonstrates these aims, using an Analog Discovery signal generator, a Waveshare CAN module and a Beagle Bone Black embedded system. The communication is generated through the socketCAN open source driver within the Linux kernel, using iproute2 and can-utils utilities.

**Project Area:** Automotive Technology, BeagleBone, Embedded Systems, Mechatronic Systems  
**Project Technology:** C/C++, Matlab, Debian Linux

### Project Number: 120

**Project Title:** Lightweight Hardware Architectures of the LEA Block Cipher for FPGA  
**Name:** Patrick Shortall  
**Email:** patrick.shortall2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Xiaojun.Wang@dcu.ie

This project centres around hardware implementations of the LEA lightweight block cipher, for constraint use scenarios within Internet of Things applications. An overview of the the most innovative hardware architectures of LEA to date are discussed and compared with two novel architectures proposed in this paper: one resource-optimised iterative implementation and one speed-optimised pipelined implementation.

**Project Area:** Cryptography  
**Project Technology:** Verilog
**Project Number: 121**

**Project Title:** Local Jobs  
**Name:** Kevin O’Neill  
**Email:** kevin.oneill35@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Charlie.Daly@dcu.ie

This project is aimed to allow “Employers” to advertise jobs they need completed, whether it be painting or cleaning a house, and local “Employees” to apply for and complete these jobs for pay. The project aims to give people who are short on time a chance to outsource tasks, and a chance for people, unemployed or not, to earn extra income. This application will be built using the MEAN stack.

**Project Area:** Web Application  
**Project Technology:** Express, Node.js, AngularJS, CSS, MongoDB, JavaScript

---

**Project Number: 122**

**Project Title:** Development of Virtual Twin for the FMS Rig  
**Name:** Senan Hughes  
**Email:** senan.hughes27@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Paul.Young@dcu.ie

This project involved replacing an outdated Omron Programmable Logic Controller (PLC) operating a Flexible Manufacturing System test rig with a modern Siemens PLC making the system run more in line with Industry 4.0 standards. Wiring and programming carried out by a previous project was corrected and the system functions as intended with the potential for networking now possible.

**Project Area:** 3-D Modelling, Automation, Control Systems  
**Project Technology:** Solidworks, PLC Programming

---

**Project Number: 123**

**Project Title:** CineSkip  
**Name:** Keith Rooney  
**Email:** keith.rooney6@mail.dcu.ie  
**Name:** Paul O’Sullivan  
**Email:** paul.osullivan35@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Markus.Helfert@dcu.ie

CineSkip is an app that provides the service of pre-purchasing cinema tickets and food for cinemas. It allows customers to receive electronic tickets in the form of a QR code, rather than having physical tickets. Once a user has pre-purchased food, they are then able to pre-order their selected food so that on arrival to the cinema, a user is able to skip the queues and collect their chosen food from a collection lane.

**Project Area:** Mobile App, Android  
**Project Technology:** XML, NoSQL, Java
Project Number: 124
Project Title: Smart Watch/Fitness Monitor
Name: Conor Egan
Email: conor.egan38@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Martin.Collier@dcu.ie

A fitness application is developed in this project. The eZ430-Chronos, a programmable smartwatch with on-board sensors, connects with a heart rate monitor wirelessly to collect and log sensor data. The smartwatch is reprogrammed to alert the user of dangerous sensor readings. A Graphical User Interface is designed on a Raspberry Pi using Python which gives the user the option to connect with the smartwatch wirelessly to receive the logged data or analyse their logged data graphically.

Project Area: Internet of Things, Raspberry Pi, Wearable Technology, Wireless Technology
Project Technology: C/C++, Python

Project Number: 125
Project Title: Opto-Electronic Shooting Rig
Name: Stanislav Jolondcovschi
Email: stanjol@yahoo.co.uk
Programme: Mechatronic Engineering
Supervisor: Tamas.Szecs@dcu.ie

This project entails the research and development of an Opto-Electronic shooting rig. The rig consists of a pistol which, when triggered emits a ray of infrared light towards a camera. The camera registers the light with which then C++ coding language along with OpenCV libraries are used to calibrate the pistol relative to the fixed position of the camera. A game is then developed using the calibrated data, after which the user’s shooting skills can be evaluated.

Project Area: Computer Vision, Device Design, Gaming, Image Video Processing, Optical Character Recognition, Software Development, 3-D Modelling, Circuit Modeling
Project Technology: C/C++, Solidworks, OpenCV, DevC++

Project Number: 126
Project Title: AALicenseManager
Name: Arran Farrell
Email: arran.farrell69@mail.dcu.ie
Name: Anita Okoye
Email: anita.okoye2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Gareth.Jones@dcu.ie

AALicenseManager is a web based application used to monitor and control the software licenses in an organisation. The application provides a platform on which the user can add, delete and update their software licenses easily and through the use of a wide range of reports, the user can monitor the compliance status of the organisation to ensure that they remain fully compliant with software license agreements.

Project Area: Data Analytics, Databases, Content Management System, Web Application
Project Technology: SQL, PHP, JavaScript, HTML5, CSS
Project Number: 127

Project Title: Development of a web-based volume rendering system using X3DOM
Name: Jaya Kumar
Email: jaya.kumar2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Robert.Sadleir@dcu.ie

Being able to interact with 3D visualisations of tomographic data from CT and MRI scans is very helpful during investigations by doctors. High-end workstations with special 3D graphics hardware are usually required to render large data sets. The key aim of this project is to create a 3D visualisation system that can be used to view large medical datasets on web browsers using X3DOM. With the added functionality of creating and applying transfer functions to the 3D model.

Project Area: Web Application, 3-D Modelling, Graphics, Image Video Processing, Software Development
Project Technology: Eclipse, HTML5, Java, JavaScript, JQuery, OpenGL, X3DOM, CSS

Project Number: 128

Project Title: Screen Capture and Livestreaming Application
Name: Daire O’ Bruachail
Email: daire.obruachail2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Brian.Stone@dcu.ie

This project is a screen capture and media livestreaming application, capable of capturing video directly from the screen, as well as audio from a microphone, and encoding them into a format which is then broadcast to a livestreaming service such as Twitch.tv or Youtube. With a focus towards casual users or those in need of a lightweight solution, the application provides an accessible client for livestreaming purposes.

Project Area: Graphics, Broadcast Software, Gaming
Project Technology: C/C++

Project Number: 129

Project Title: Design and Manufacture of an Attachment for Wood Milling Router Tools
Name: Ali Al Makhmany
Email: ali.almakhmany2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Tamas.Szecsi@dcu.ie

This project aims to finely adjust the wood router in two different directions by designing and manufacturing an attachment for wood milling router. The wood router attachment can be used to control the side and rotary movement of the router. Additionally, strength analysis was performed to determine whether the attachment withstands the weight of the router and identify the locations of maximum deformation and stress.

Project Area: Finite Element Analysis, Mechanical Design and Manufacture
Project Technology: ANSYS Workbench, Solidworks
Project Number: 130
Project Title: L.A.M.P
Name: James McDonald
Email: james.mcdonald34@mail.dcu.ie
Name: Gavin Strong
Email: gavin.strong2@mail.dcu.ie
Name: Jack Tuffy
Email: tuffy.jack2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jane.Kernan@dcu.ie

The system that we designed is as an online smartwatch application and monitoring system. The system allows people to monitor the wearer through a wearable device that they will have on their wrist, which in turn will link to an application on the users phone. Users will be able to view information on the app in regards to the person wearing the watch, which will include a location tracker, their heart rate monitor, a impact/fall detector, geofencing, & scheduled alerts.

Project Area: Android, Wireless Technology
Project Technology: CSS, HTML5, JavaScript

Project Number: 131
Project Title: Simulation, Design and Manufacture of Non Circular Gears
Name: Mohamed Al-Naamani
Email: mohamed.alnaamani2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Tamas.Szecsi@dcu.ie

If a shape of a certain gear [cutting tool] is known, the shape of the other gear [gear blank] can be found by simulation. In this project, Solidworks API along with VBA are used to develop a code which functions to rotate the cutting tool about the gear blank in such a relative motion. The teeth contours resulting from rotating the cutting tool represent the volume that needs to be subtracted to produce teeth in gear blank.

Project Area: Mechanical Design and Manufacture, Simulation, Software Development
Project Technology: Solidworks, Solidworks API and Visual Basic for Applications (VBA)

Project Number: 132
Project Title: Eitlean Booking
Name: Owen Matthews
Email: owen.matthews2@mail.dcu.ie
Name: Pádraig Ó Cuirc Bolta
Email: padraig.ocuircbolta2@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Jane.Kernan@dcu.ie

Eitlean Booking is a booking management web application for private flight lessons. It allows clients to book a date and pay for a lesson online. It also allows for the management of said bookings by flight training organisations (or FTOs) through user accounts, as well as providing their clients with an accessible and modern booking experience which which aims to improve the overall customer experience and increase customer retention levels.

Project Area: Databases, Mobile App, Web Application
Project Technology: CSS, HTML5, JavaScript, MySQL, Bootstrap
Project Number: 133

Project Title: Virtual Robot Experimentation Platform for Path Planning Investigation
Name: Emmet Cullen
Email: emmet.cullen27@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Jennifer.Bruton@dcu.ie

This project contrasts the use of the Virtual Robot Experimentation Platform’s (V-Rep’s) native path planning calculation module against the use of an external API – the Open Motion Planning Library (OMPL) – and its integration through embedded scripts. The meticulous set up of the V-Rep environment was analysed. Rigorous testing was performed on the use of both methods for their ability to produce accurate and repeatable shortest path solutions from a start to target location in a specially designed test map.

Project Area: Mechatronic Systems, Robotics, Simulation, Virtual Reality
Project Technology: C/C++, Lua, Virtual Robot Experimentation Platform, Open Motion Planning Library

Project Number: 134

Project Title: DCU Damo: Chatbot
Name: Jordan Mulvaney
Email: jordanmulvaney02@gmail.com
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

DCU Damo is a chatbot that answers DCU related queries. The bot specializes in queries related to Timetable information and Lecturer information. DCU Damo is accessed through it’s Facebook page where it can be privately messaged with a query. The query is pulled from Facebook using node.js and is broken down by the bot. A java program was written to take the broken down query and format an accurate response for the user which is pushed back to Facebook.

Project Area: Artificial Intelligence, Software Development, Databases
Project Technology: Java, MySQL, Node.js

Project Number: 135

Project Title: Short fibre reinforced calcium phosphate bone cement
Name: Rebecca Guyett
Email: rebecca.guyett2@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Nicholas.Dunne@dcu.ie

Injectable bone cements are routinely used to stabilise fractures and for the fixation of implants to bone. Calcium phosphate based cement has good biocompatibility but poor mechanical properties compared to polymer based cement and is not currently used for load bearing applications such as vertebroplasties. The aim of this project is to improve fracture behaviour of CPC through incorporation of short fibres whilst retaining injectability. Similar techniques have been employed to improve the fracture behaviour of concrete.

Project Area: Biomedical Engineering
Project Technology: Mechanical analysis
Project Number: 136
Project Title: Student Attendance Tracking
Name: Lonneke Schutte
Email: lonneke.schutte2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Mark.Roantree@dcu.ie

This project consists of an app that tracks and stores the attendance data of students for individual classes. Using student ID barcode scanning for the identification of students, class check in slots are allocated based on the respective timetables allowing for simple check in via mobile device. Geo-location and time-stamping are used to confirm the validity of attendance, with the data gathered being intended for use by academic staff and analysis.

Project Area: Android, Cloud Computing, Mobile App
Project Technology: Java

Project Number: 137
Project Title: Swiped
Name: Conor Marshall
Email: conor.marshall8@mail.dcu.ie
Name: Nathan Prendergast
Email: Nathan.prendergast3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Andrew.McCarren@dcu.ie

Swiped is an online virtual shopping centre, that provides fast, easy browsing and shopping by using swipe technology to browse items. Through machine learning it documents customer behaviour to more accurately recommend items to the customer and provide real time data analytics to the retailer based on their customer’s likes, dislikes and spending patterns. Swiped provides benefits to both customer and retailer which sets it apart from competing apps.

Project Area: E-Commerce, Databases, Data Analytics, Mobile App
Project Technology: CSS, HTML5, JavaScript, MySQL, PHP

Project Number: 138
Project Title: Letter Writing Checker
Name: Daragh Lawlor
Email: daragh.lawlor27@mail.dcu.ie
Programme: Computer Applications
Supervisor: Monica.Ward@dcu.ie

The project was developed to help my 4yr old child learn his letters and to store statistics on his letter writing development.

Project Area: Android
Project Technology: Java
### Project Number: 139

**Project Title:** Never-Lost  
**Name:** Renatas Nedzveckas  
**Email:** renatas.nedzveckas2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

Never-Lost allows users to share their location with friends and family. This application can be used when the user needs directions or wants their location to be monitored, for example if the user is on their way home at night. Users can create geofences, which are triggered on exit, when they expect to stay within an area for some time. Travel patterns can be recorded to predict the user’s future trips as an aid for users living with Dementia.

**Project Area:** Software Development, Mobile App, GPS GIS, Databases, Cloud Computing, Android  
**Project Technology:** Geofencing, Firebase Realtime Database, Room Persistence Library, Google Maps API, Android Studio, SQLite, Java

### Project Number: 140

**Project Title:** Modelling of Distributed Small Scale Solar Energy Systems  
**Name:** Rory Clear  
**Email:** rory.clear2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Barry.McMullin@dcu.ie

This project investigates the relative merits and trade-offs of both thermal (water heating) and electricity (Photovoltaic) along with energy storage methods, resulting in an online decision-support tool that allows potential users in Ireland of solar energy systems to explore the lifetime costs and benefits of such systems.

**Project Area:** Electric Generation  
**Project Technology:** HTML5, Java, JavaScript, MySQL, Node.js

### Project Number: 141

**Project Title:** Design and control a new pumping system for steady flow  
**Name:** Niall O’Connor  
**Email:** niall.oconnor44@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Yan.Delaure@dcu.ie

The purpose of this project is to design a lab scale pumping system with a focus on producing a steady flow. The system includes precision flow meters, pressure sensors and an electrovalve. The purpose of the electrovalve is to regulate the flow in case a transient disturbance occurs. The project investigates several alternative control loops to identify the optimal control of the system. The system is also theoretically analysed.

**Project Area:** Control Systems, Fluid Mechanics  
**Project Technology:** Excel/VB, LabVIEW, Solidworks
### Project Number: 142

**Project Title:** PitchBook - A service which allows users to book and manage sports pitches in the form of a web application  
**Name:** Andreas Poppmeier  
**Email:** andreas.poppmeier2@mail.dcu.ie  
**Name:** Conor Dolan  
**Email:** conor.dolan26@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Paul.M.Clarke@dcu.ie  

An application available on both mobile and desktop platforms providing users with the capability to reserve available sports pitches and sports facilities as well as the capability to list additional pitches. This web app aims to provide a seamless approach to the steps involved in booking a pitch. A built in reservation and booking system is provided listing available time slots. The application also allows users to see their listed pitches and the reservations made for that particular user.

**Project Area:** Web Application, Network Applications, Mobile App, Databases  
**Project Technology:** REST, PHP, Node.js, MySQL, JQuery, JavaScript, HTML5, CSS

### Project Number: 143

**Project Title:** Braikout - Cryptocurrency & FX Trading Platform  
**Name:** Ross Franey  
**Email:** ross.franey3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Martin.Crane@dcu.ie  

This web-based platform aims to provide FX and Cryptocurrency traders with several advantages over traditional exchange interfaces, allowing for more informed positions and subsequently, increased profit! These include:

1) Machine Learning price action predictions and Automatic Trading Algorithms  
2) Automatic Candlestick Chart Technical / Time-series Analysis  
3) Social media and order-book Sentiment Analysis  
4) Data Analytics - Collection & Visualisation of Intra-day and Historical trade data  
5) Notifications of potential buy/sell opportunities to an Android Application

**Project Area:** Android, Artificial Intelligence, Cloud Computing, Data Analytics, Mobile App, Model View Controller, Natural Language Processing, Web Application  
**Project Technology:** AngularJS, CSS, HTML5, Java, JavaScript, JQuery, MySQL, NoSQL, Python, REST, Scilab, AWS, Django, chartJS, JSON REST, Keras, DynamoDB, Google Firebase, Scrapy

### Project Number: 144

**Project Title:** Development of test rig to assess the functional properties of tissue engineered heart valves  
**Name:** Seán Curtis  
**Email:** sean.curtis6@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Tanya.Levinson@dcu.ie  

Engineered heart valves are an increasing area of interest in the medical world. Currently mechanical and biological heart valves are used as replacement techniques. The project assessed the properties of tissue engineered heart valves (TEHV) using alginate hydrogels. A test rig was designed to investigate the valves functionality, flow restriction and durability under physiological flow conditions. TEHV are the future for valve replacement as they may reduce the need for reoccurring surgeries, which would benefit younger patients.

**Project Area:** Tissue Engineering, Fluid Mechanics  
**Project Technology:** LabVIEW
**Project Number: 145**

**Project Title:** Maths AR  
**Name:** Odhrán Daly  
**Email:** odhran.daly25@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Monica.Ward@dcu.ie

Maths AR is an augmented reality application that will enhance children’s ability to understand concrete materials and represent them as pictorial objects. The maths tasks are based on the mathematics curriculum that teachers in Irish primary schools teach. Through the use of Apple’s new Augmented Reality technology, lessons & challenges will be created to help children better understand the topic using an Apple iPad. A web portal is created to help teachers track children’s performance on individual topics.

**Project Area:** Augmented Reality, Educational, Mobile App, Web Application  
**Project Technology:** CSS, Objective-C, HTML5, JQuery, Node.js, NoSQL, Swift

---

**Project Number: 146**

**Project Title:** A comparison of results filtering nanoparticles manually and using Uv-Vis Spectroscopy to determine the weight and size distributions of colloids  
**Name:** Daniel Whitty  
**Email:** daniel.whitty2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Dermot.Brabazon@dcu.ie

Nanoparticle colloids were made using pulsed laser ablation. The colloid samples were filtered through different sized filters to achieve specific sized nanoparticles in each colloid. The filtered colloid were then used in Uv-vis spectroscopy to determine the concentration of nanoparticles in the liquid. A comparison was then made between the concentration and size of the nanoparticles in the colloid before and after filtration.

**Project Area:** Advanced Material Engineering  
**Project Technology:** Uv-vis spectroscopy

---

**Project Number: 147**

**Project Title:** Functional Specification  
**Name:** Mark Dunne  
**Email:** mark.dunne54@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Stephen.Blott@dcu.ie

This project allows users to automate or script certain task. The project has an API that is accessible through the JavaScript. This API allows users to manipulate their device. This project waits for system events, such as the device’s battery is low on power, and executes any script associated with that event.

**Project Area:** Android, Mobile App  
**Project Technology:** Java, JavaScript
Project Number: 148
Project Title: BlockTract
Name: Conor Henry
Email: conor.henry23@mail.dcu.ie
Name: Danny ó Gallchoir
Email: danny.ogallchoir3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Alistair.Sutherland@dcu.ie

‘BlockTract’ is a platform that facilitates the instant transfer of funds in settling travel insurance contracts between two independent parties in a secure and efficient manner focusing solely on flight delays and cancellations. The service is provided to insurance companies via an API implementation which operates on the ‘Ethereum Blockchain’ network and makes use of smart contracts to trigger payment events. These smart contracts are triggered using provided flight status API’s from specified airlines.

Project Area: Web Application, Security, E-Commerce
Project Technology: Ajax

Project Number: 149
Project Title: TeachMeCode
Name: Igor Strelkov
Email: igor.strelkov2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Stephen.Blott@dcu.ie

The aim of the project was to create a learning platform that allows 3rd level students to book private tutors that will assist them in learning a certain programming language. The app allows you to select the date and time that suits both parties using the fully integrated calendar, it also allows them to share a collaborative terminal between each other and last but not least the app has a full video and audio capabilities for the best user experience possible.

Project Area: Web Application, Telecommunications, Software Development
Project Technology: Node.js, REST, CSS, HTML5, JavaScript, AngularJS, JQuery, MongoDB

Project Number: 150
Project Title: Nutrition and Dieting web application.
Name: Kvetoslava Sliacanova
Email: kvetoslava.sliacanova2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Renaat.Verbruggen@dcu.ie

The web application is designed to allow users to get nutrition advice tailored to their needs. By entering some personal information like height, weight etc. and lifestyle information like the amount of physical activity they do per week, an individual profile is made for the user. Using that data provided the application calculates the recommended diet plan for the user and provides them with suitable recipes.

Project Area: Web Application
Project Technology: CSS, HTML5, JavaScript, MySQL, Python, REST
Project Number: 151
Project Title: Electronic Bass Drum Design
Name: Robin Blakey
Email: robin.blakey2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Alan.Kennedy@dcu.ie

The purpose of this project is to redesign the electronic bass drum pedal. This is done by examining the downfalls of current electronic and acoustic bass drum pedals. An entirely new design is used to overcome these shortcomings. The final design incorporates an innovative single piece polymer hinge that bends about itself, instead of a mechanical hinge. The electronic output is comprised distance sensors to transduce the that is to be differentiated to find the velocity of the hit.

Project Area: Additive Manufacturing, Device Design, Finite Element Analysis, Mechanical Design and Manufacture
Project Technology: Solidworks, PLW Pico log

Project Number: 152
Project Title: Ebook Reader
Name: Ciarán Murphy
Email: murpc286@mail.dcu.ie
Programme: Computer Applications
Supervisor: Donal.Fitzpatrick@dcu.ie

This program takes a standard ebook file and speaks it out using a voice synthesizer. The program uses the structure and metadata of the file to create an easily navigable interface. The user uses voice commands or keyboard shortcuts to easily move back and forth in the book.

Project Area: Speech Recognition
Project Technology: Python

Project Number: 153
Project Title: Fibre Reinforced Actuators
Name: Liam Clarke
Email: liam.clarke37@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Jeremiah.Murphy@dcu.ie

Soft Robotics is an area of robotics dealing with constructing robots from highly compliant materials, like those found in living organisms. Soft actuators that are made of elastomeric materials are a big area of interest in the robotics community lately because of their rapid prototyping capabilities and they have different abilities to that of the traditional robot. This initial investigation involved building a soft actuator and testing it to determine its capabilities for various levels of compressed air.

Project Area: Arduino, Robotics
Project Technology: Solidworks
Project Number: 154

Project Title: Design, Build and Testing of a Pneumatic Air Muscle
Name: Sean Rocks
Email: sean.rocks2@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Jeremiah.Murphy@dcu.ie

Pneumatic Air Muscles are an area of increasingly popularity, especially in the design of humanoid robots. They offer a lightweight alternative to pneumatic cylinders. This project investigates the design methods of an air muscle and tests multiple air muscles to establish the reaction to different pressures. This project also involves the design and build of a device attachable to the human arm which is powered by a pneumatic air muscle.

Project Area: Mechanical Design and Manufacture
Project Technology: Solidworks

Project Number: 155

Project Title: Social Media User Behaviour Analyser based on Gender Studies
Name: Ina Mari Fe Pondoc
Email: ina.pondoc2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

This project involves a web application developed in the Python Flask framework that analyses user behaviour on social media based on gender studies. Using natural language processing and computational social science, user posts from Twitter and Redbrick are analysed for patterns in reply length, word-term frequency, argument relevance and progression of argument within a discussion. Insights into any disparity between the different genders in terms of the user behaviours mentioned are visualised through the web application.

Project Area: Natural Language Processing, Web Application, Data Analytics
Project Technology: SQL, Python, REST

Project Number: 156

Project Title: Ion Doped Calcium Phosphate Cement
Name: Niall O’Shaughnessy
Email: niall.oshaughnessy4@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Nicholas.Dunne@dcu.ie

Calcium Phosphate Cements (CPC) have been used as a bone repair material successfully in surgical applications for many years. The biological properties and advantages of this material are well documented, however, their mechanical properties are not suitable for high loading areas of the body such as the spine. The aim of this project was to determine the effect of substituting Magnesium ions into CPC by analysing their mechanical and handling properties.

Project Area: Advanced Material Engineering
Project Technology: Excel/VB
Project Number: 157
**Project Title:** GPGPU Accelerated Spectral analysis  
**Name:** Nathan Mindomba  
**Email:** nathan.mindomba2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Conor.McArdle@dcu.ie

This project is an analysis of a GPGPU working in a heterogeneous system, the GPU acts as a co-processor in the system. The analysis is achieved using NVIDIA Tesla K40c graphics card and NVIDIA's parallel programming API CUDA. The aim is to implement a Parallel Fast Fourier Transform that takes an input from the sound card of a PC and a RTL-SDR dongle and demonstrate it as a high resolutions spectral analysis tool.

**Project Area:** DSP  
**Project Technology:** DSP, Eclipse, Matlab, SDR – Software defined radio, CUDA, Fast Fourier Transform, Java, C/C++

Project Number: 158
**Project Title:** Quoter  
**Name:** Shane Farrelly  
**Email:** shane.farrelly55@mail.dcu.ie  
**Name:** Ian McEvoy  
**Email:** ian.mcevoy2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Paul.M.Clarke@dcu.ie

Quoter is a website that is designed to make it easier for people to purchase insurance, mortgage protection and pensions from independent brokers in their area. The customer simply comes onto the website, enters some basic information that is then sold onto the independent brokers. The website also provides a service for the broker which allows them to manage the information that they have purchased by allowing them schedule meetings with customers and check and update their progress with customers.

**Project Area:** Databases, Web Application  
**Project Technology:** CSS, HTML5, PHP, SQL

Project Number: 159
**Project Title:** Car Deal Spotter  
**Name:** Glen Devlin  
**Email:** glen.devlin4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Darragh.0Brien@dcu.ie

This project aims to find cars that are being sold at a good price on the website carsireland.ie. Using data scraped from the website, a predictive model was built. The model was then used to find cars that were being sold at good prices i.e. the selling price of the car was less than the value of the car. An android app acts as the front end of the project, allowing users to browse and value cars.

**Project Area:** Android, Data Analytics, Data Mining  
**Project Technology:** Python, Java, MySQL
Project Number: 160
Project Title: Impact of Preventive Maintenance on Lean Manufacturing Productivity
Name: Haifa Asiri
Email: Haifa.asiri3@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: John.Geraghty@dcu.ie

Lean manufacturing target elimination of waste through continuous improvement. The problems of maintenance process are often addressed through loss elimination and continuous improvement programmes. The Preventive Maintenance enhances and improves the lean production only if it is applied properly in the industry. The project aims to develop simulation models that will help medical device companies to make the right decision regarding their maintenance strategy.

Project Area: Biomedical Engineering, Lean Manufacturing
Project Technology: ExtendSIM

Project Number: 161
Project Title: Visualize Dataset
Name: Rahma Ahmed
Email: rahma.ahmed2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Alistair.Sutherland@dcu.ie

This project is a MATLAB program that takes datasets in CSV files as its input and outputs descriptive data summary of its columns along with their graphical representations. It also has a predictive modeling functionality where it can predict a possible relationship between these columns and output the percentage error of the produced function. The system is used by data analysts for the visualization of their datasets, researchers for easy GUI and usability, and by students as a learning tool.

Project Area: 3-D Modelling, Data Analytics, Data Mining
Project Technology: Matlab

Project Number: 162
Project Title: Android Application for Diet Management with Machine Learning, Image Classifier & IoT Device
Name: Luke Scales
Email: luke.scales2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Bryan.MacDonald@dcu.ie

This project uses Google’s TensorFlow machine learning library, trained with a mobile-optimised image classifier, to detect the user’s food or ingredient. Once classified, the application retrieves the nutritional information of the food, from either local data or a RESTful database. Finally, the connected Bluetooth kitchen scale records the weight and sends this to the application for calculations. The application successfully simplifies the task of logging meals and reduces the time and effort required in current meal logging applications.

Project Technology: TensorFlow, XML, C/C++, Docker, Excel/VB, Java, Python, REST, SQLite
Project Number: 163
Project Title: Development of a Tough Adhesive Calcium Phosphate Cement
Name: Niamh Murphy
Email: niamh.murphy67@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Owen.Clarkin@dcu.ie

Bone cements have been used in bone augmentation, prosthesis fixations and facial reconstructions for decades. Calcium phosphate cements (CPC) are ideal for orthopaedic surgical practices, but are very brittle and thus not commonly used in load bearing applications. This project investigates the manufacturing of TTCP for the development of a tough CPC for vertebral compression fractures. Mechanical test methods were designed and used to characterise the strength and modulus of the material, while analysis was done to investigate its microstructure.

Project Area: Advanced Material Engineering, Biomedical Engineering, Mechanical Design and Manufacture
Project Technology: Solidworks

Project Number: 164
Project Title: Control of Reverse Osmosis Fouling Mitigation
Name: Cian Brogan
Email: cian.brogan4@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Lorna.Fitzsimons@dcu.ie

Water treatment, including desalination, is becoming increasingly necessary to meet various water quality demands whether it be for potable, industrial, or agricultural use. Currently, one of the most widely used methods of desalination technology is Reverse Osmosis. This project investigates the process of Reverse Osmosis. The aim of this project is to simulate and test multiple Reverse Osmosis system configurations to try determine the most cost effective and energy efficient system.

Project Area: Energy Conservation, Simulation, Water Treatment
Project Technology: Solidworks, Reverse Osmosis System Analysis

Project Number: 165
Project Title: Hybrid Membrane Reverse Osmosis
Name: Oliver Hamilton
Email: oliver.hamilton20@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Lorna.Fitzsimons@dcu.ie

This project investigates the design and operation of a hybrid membrane reverse osmosis for two specific water treatment plants. Both plants offer specific operating conditions that were assessed in the development the reverse osmosis system. Commercially available software, ROSA and IMSDesign, were used to develop and simulate various possible solutions, and from the resulting data, an optimum hybrid membrane reverse osmosis system was developed.

Project Area: Water Treatment
Project Technology: DOW ROSA, IMSDesign by Hydranautics
**Project Number: 166**

**Project Title:** HealthKick  
Name: Chris Horgan  
Email: chris.horgan22@mail.dcu.ie  
Name: Sarah-Jane Irwin  
Email: sarahjane.irwin4@mail.dcu.ie  
Programme: Enterprise Computing  
Supervisor: Alan.Smeaton@dcu.ie

HealthKick is a web app for mobile devices. It displays health metrics based on data collected by other health apps/sensors to provide the user with one singular view on their health, and gives the user the ability to compare different datasets. An additional function in HealthKick is the ability to compare sleep and activity data to calculate future activity performed by the user, based on a linear regression model.

**Project Area:** Data Analytics, Mobile App, Wearable Technology, Web Application  
**Project Technology:** CSS, HTML5, JavaScript, MySQL, PHP, REST

**Project Number: 167**

**Project Title:** Design and Development of a Software Defined Radio-Based System for 21cm Wavelength Radio Astronomy  
Name: Eoin Morrissey  
Email: eoin.morrissey26@mail.dcu.ie  
Programme: Mechatronic Engineering  
Supervisor: Patrick.McNally@dcu.ie

Radio astronomy is a modern science concerned with the mapping of celestial objects and space in general through radio frequency scanning methods rather than traditional visual methods. This project centres around the development of a basic radio telescope design, incorporating a software defined radio and a home-built feed horn among other components, which will be assembled and tested for its effectiveness in applications in the field of radio astronomy.

**Project Area:** Sensor Technology, Telecommunications  
**Project Technology:** SDRuno

**Project Number: 168**

**Project Title:** Electio - Applications of Electoral Systems using the Ethereum Blockchain  
Name: Patrick Morris  
Email: patrick.morris25@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Geoff.Hamilton@dcu.ie

Electio is an e-voting dapp, [decentralized-application] that allows election administrators to deploy an electoral system of their specification and allow voters to vote securely and verifiably in elections. Electio is designed to remove the need for the centralized tallying of votes which is a major security flaw across many centralized e-voting systems. By using blockchain technology, Electio allows for greater transparency during the election process as the result is generated by everyone rather than the election authority.

**Project Area:** Web Application, Cryptography  
**Project Technology:** Ethereum, Solidity, Web3.js, React, Redux, Truffle, Node.js, JavaScript, Java
Project Number: 169
Project Title: Test and Model the Interaction of Immersed Solids in Fluid Flow
Name: Cian Byrne
Email: cian.byrne229@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Yan.Delaure@dcu.ie

This project incorporates the study of Fluid Structure Interaction (FSI) and the use of a Stepper Motor programmed with Arduino Open Source Technology to allow Linear Motion within an Experimental Tank with Water. The Experimental Rig was designed with Solidworks for the specific use of Testing and Modeling Immersed Solids in Fluid Flow. FSI is an important tool in industries such as Aerospace, Power generation, and the Automotive Industry.

Project Area: Arduino, Fluid Mechanics, Mechanical Design and Manufacture, Thermodynamics
Project Technology: Solidworks

Project Number: 170
Project Title: Bookworm
Name: Simon Lowry
Email: simon.lowry5@mail.dcu.ie
Programme: Computer Applications
Supervisor: Darragh.OBrien@dcu.ie

Bookworm is a .NET web application which allows you to review books, have a unique profile and gain insight into other books that you might be interested in. This insight is gained using a recommender system which makes use of a machine learning algorithm from an open-sourced tool called MyMediaLite. Its architecture is designed using 5 layers, with MVC making up the first three layers followed by a service layer and a repository layer which carry out all database interactions.

Project Area: Data Mining, Model View Controller, Software Development, Web Application
Project Technology: Java, JavaScript, SQL, Entity Framework, NUnit, FakeItEasy, MVCBootstrapper, MyMediaLite, HTML5, CSS, C#, .NET

Project Number: 171
Project Title: Visual Feature Encoding & Transmission from Edge Devices
Name: Kevin Bambrick
Email: kevin.bambrick2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Kevin.McGuinness@dcu.ie

Sending visual data to a cloud or server for centralized decision making can create bottlenecks in the networks processing. Convolutional neural networks (CNNs) process images through non-linear layers. Developed here is a technique for partitioning a CNN between an edge and host platform and an encoding technique for video data analysis. The encoding scheme uses lossy encoding which facilitates the trade-off between; decreasing the size of the data for a maximum 1% loss in the networks accuracy.

Project Area: Artificial Intelligence, Computer Vision
Project Technology: Python
Project Number: 172
Project Title: Cryptocurrency Trading Strategy Dashboard
Name: Sean Sinnott
Email: sean.sinnott4@mail.dcu.ie
Programme: Computer Applications
Supervisor: Andrew.McCarren@dcu.ie

Understanding how trading strategies apply to cryptocurrencies is no easy feat. This web application allows users to configure and run simulations of numerous types of trading strategies using historical cryptocurrency prices and a graphical user interface. The application back-tests the strategies designed by the user on real data and presents them with a statistical summary of the performance and outcomes. The user can choose from multiple cryptocurrencies, fiat currencies and trading strategies.

Project Area: Databases, Data Analytics, Model View Controller, Simulation, Web Application
Project Technology: Python, jQuery, Node.js, MySQL, JavaScript, CSS, HTML5

Project Number: 173
Project Title: Design and build a test rig for the study of a reciprocating pump
Name: Cathal Duggan
Email: cathal.duggan23@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Yan.Delaure@dcu.ie

The aim of this project is to successfully drive a reciprocating pump with minimal leakage. There is to be a model built on Solidworks, that will be taken in to Ansys to be analysed on rigid body Dynamics, these results shall be compared with theoretical results, and only made if this comparison proves to have similar readings. The rig when built shall have the theoretical and Ansys results compared with the built rig using a tachometer.

Project Area: 3-D Modelling, Fluid Mechanics, Motion Analysis, Simulation, Thermodynamics
Project Technology: ANSYS Workbench, Excel/VB, Solidworks

Project Number: 174
Project Title: The Manufacture of Porous Tissue Engineering Scaffolds using Supercritical Fluid
Name: Mark Heaney
Email: mark.heaney2@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Garrett.McGuinness@dcu.ie

The goal of this project was to identify a viable heating solution that would be capable of heating a pressure vessel to a temperature above 31°C and maintaining that temperature for a sustained period of time, in order to turn solid CO2 supercritical such that a dense but flowing substance is created. This would then diffuse into a polymer mould, the carbon dioxide then vented, and a cell scaffold left as the result.

Project Area: 3-D Modelling, Biomedical Engineering, Fluid Mechanics, Tissue Engineering
Project Technology: ANSYS Workbench, Solidworks
**Project Number: 175**

**Project Title:** A PID control rig to demonstrate the characteristics of proportional, integral and derivative control

**Name:** Damien Moorehead  
**Email:** damien.moorehead2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Harold.Esmonde@dcu.ie

Control using inputs based on proportional, integral and differential (PID) error terms is used widely in industry and thus relevant when training engineers. In this project a simple test rig is developed and analysed to assess the benefits of this type of control. By consideration of the system behaviour, a virtual model has been designed which simulates the physical system closely. From results of experimental testing it is believed that this system would be suitable for undergraduate teaching purposes.

**Project Area:** Control Systems, Mechatronic Systems  
**Project Technology:** LabVIEW, Matlab, Simulink

---

**Project Number: 176**

**Project Title:** Development and testing of a Project Based Learning approach

**Name:** Sharawn Ahaotu Simelane  
**Email:** Sharawn.ahaotusimelane2@mail.dcu.ie  
**Programme:** Manufacturing Engineering with Business  
**Supervisor:** John.Geraghty@dcu.ie

The modern engineering profession deals with uncertainty. With incomplete data and often conflicting demands from clients and the general public. Engineers require skills in human relations and technical competence. This report will demonstrate why PBL (Project based learning) can act as a benefit to the current structure of the module: Operations research methods. Through social expectation, and the self-driven pressure to preform favourably. This report will demonstrate how for each fortnightly, student lead presentation, PBL forces each group member to become their best self.

**Project Area:** Educational  
**Project Technology:** Excel/VB

---

**Project Number: 177**

**Project Title:** Investigation into the existence and control of chaos in switching converters

**Name:** John Connolly  
**Email:** john.connolly57@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Marissa.Condon@dcu.ie

Chaos exists in switching converters with feedback control, and this nonlinear phenomenon deteriorates the performance of switching converters. Therefore, an effective way of controlling chaos is of great importance in engineering. In this investigation, there is a simulation and experimental study of methods of controlling chaos in the voltage-mode buck converter controlled by PWM (Pulse Width Modulation).

**Project Area:** Power Electronics  
**Project Technology:** Matlab, Simulink, Pspice
**Project Number: 178**

**Project Title:** Efficient FPGA Implementation of the Lightweight LED Block Cipher  
**Name:** Neto Ukpong  
**Email:** neto.ukpong2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Xiaojun.Wang@dcu.ie  

The project involves the implementation of the Lightweight Encryption Device Block Cipher. Comparing different implementations of the same cipher to ascertain which implementation is the most efficient. Keeping the features of the cipher constant, the performance of each implementation of the cipher is compared against the other ones. All implementations are done using VHDL programming language. The simulations are done on Vivado Design Suite.

**Project Area:** Cryptography  
**Project Technology:** FPGA, VHDL

---

**Project Number: 179**

**Project Title:** Development of a device for the narrowing of the pylorus to help facilitate weight loss  
**Name:** Aidan Jones  
**Email:** aidan.jones22@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Tanya.Levingstone@dcu.ie  

This project is a development of the pyloric project: an implant for facilitating weight loss, for the company Trinitas. The project investigates the different variations of needle tips for penetration into stomach tissue. The project aims to find the ‘ideal’ needle tip for this process. The ‘ideal’ needle tip produces the least reaction force during insertion, and results in minimal deflection of the stomach tissue.

**Project Area:** Biomedical Engineering, Device Design  
**Project Technology:** Excel/VB, Solidworks

---

**Project Number: 180**

**Project Title:** Multiplayer Word Game  
**Name:** Kevin Sweeney  
**Email:** kevin.sweeney25@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Darragh.OBrien@dcu.ie  

An Android Multi-player word game, which uses Google Play Game Services API to allow players to find and compete against opponents over the network. It uses a Trie data structure to efficiently store and find words.

**Project Area:** Android  
**Project Technology:** Java
Project Number: 181

Project Title: Self Balancing Two Wheeled Vehicle
Name: Paul Queally Gallagher
Email: paul.queallygallagher2@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Harold.Esmonde@dcu.ie

This project concerns the control of a two wheeled self-balancing vehicle via smartphone. The purpose of the project is to provide DCU with an interesting model for display on opens days. It is to serve as a demonstration of control theory and its application using an everyday item all the while advertising the engineering skills and education gained by DCU students. This project involves mechanical and electronic design and manufacture, system modelling, controller design and implementation through app development.

Project Area: Android, Control Systems, Mechatronic Systems, Mobile App, Simulation, Software Development
Project Technology: Java, Matlab, Simulink, Solidworks

Project Number: 182

Project Title: Electrospinning of fibre-gel composites for future blood vessel applications
Name: Mark O Connor
Email: mark.oconnor232@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Garrett.McGuinness@dcu.ie

The project involved the development of fibre-gel composites with tissue-like mechanical properties. To achieve these features, flat composite specimens were developed by creating biomaterials composed of soft, hydrated matrix materials reinforced with electrospun fibres. This was achieved by combining electrospun PCL fibres with a PVA solution and subjecting both materials to freeze-thaw cycling to form a composite material. The resulting fibre-gel composites were mechanically tensile tested to determine if tissue-like mechanical properties were achieved.

Project Area: Biomedical Engineering, Tissue Engineering
Project Technology: Excel/VB

Project Number: 183

Project Title: Heracles
Name: Terry Bolt
Email: terence.bolt2@mail.dcu.ie
Name: Wojciech Bednarzak
Email: wojciech.bednarzak2@mail.dcu.ie
Programme: Computational Problem Solving and Software Development
Supervisor: David.Gray@dcu.ie

Heracles is a map-reduce framework designed for parallel data processing on a large scale. It is written in Rust and Go, and has a focus on an accessible API backed by an intuitive async implementation. It leverages existing technologies to provide reliability and scalability.

Project Area: Cloud Computing, Distributed Systems, Network Applications
Project Technology: Docker, Go, Rust
**Project Number: 184**

**Project Title:** Delock decentralized rental system  
**Name:** Mark McAdam  
**Email:** mark.mcadam4@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** David.Sinclair@dcu.ie

The goal of Delock is to give anyone the ability to rent or share their personal assets with others safely and securely. Delock is built on top of the Ethereum Blockchain, this gives an immutable record of all transactions on the system and removes the need for trust between users. Ethereum’s Smart Contracts give everyday objects the capacity to perform actions on the blockchain and serve as the brains of the objects allowing users to interact with and rent them.

**Project Area:** Android, Arduino, Mobile App  
**Project Technology:** C/C++, Java, Solidity

---

**Project Number: 185**

**Project Title:** Microbubble generation for wastewater processing: Mixing Tank Design  
**Name:** Mohammed Hammed AL Adawani  
**Email:** mohammed.aladwani2@mail.dcu.ie  
**Programme:** Mechanical and Manufacturing Engineering  
**Supervisor:** Yan.Delaure@dcu.ie

The main objective of this project is to investigate how to decrease the bubble sizing in water streams to improve oxygen dissolution through mechanically mixing the stream while increasing the time at which the stream is passing the tank. The investigation will be based on a provided tank where the internal part of it will be designed in a way that would achieve the objectives.

**Project Area:** Fluid Mechanics  
**Project Technology:** SolidWorks & CFD

---

**Project Number: 186**

**Project Title:** A PYNQ-based Logic Analyzer and Pattern Generator  
**Name:** Jack McDonald  
**Email:** jack.mcdonald29@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Derek.Molloy@dcu.ie

The aim of this project is to test the input/output limitations of the PYNQ-Z1 board through the use of a logic analyser and pattern generator built and run on the board. Using the PYNQ open source platform and the Logictools overlay that consists of programmable hardware blocks for Finite state machines, Boolean logic functions, trace analysers and digital pattern generators it is possible to program the programmable logic circuits for the FPGA through Python.

**Project Area:** Embedded Systems, DSP, Software Development  
**Project Technology:** Python, FPGA
Project Number: 187
Project Title: CompShare
Name: Ciaran Moylan
Email: ciaran.moylan3@mail.dcu.ie
Programme: Enterprise Computing
Supervisor: Cathal.Gurrin@dcu.ie

This project is a Mobile Application for both iOS and Android. The basic concept revolves around promotional competitions and streamlining sharing them in App. An App that companies and other entrepreneurial individuals can pay to upload a competition for a period of time, people can download this, create an account / profiles and share to other sites to have a chance of winning. It is made specifically to be easy to use, browse and share. Winners are announced in App.

Project Area: Mobile App
Project Technology: CSS, HTML5

Project Number: 188
Project Title: Aircraft Airspeed Indicator Tester
Name: Stephen Kenny
Email: stephen.kenny37@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Noel.Murphy@dcu.ie

The is capable of correcting for dependencies in ambient pressure, temperature and density from the International Standard Atmosphere (ISA) conditions of 1013hPa, 15 degrees Celsius and zero altitude. This was achieved by using a water-based manometer to calibrate a differential pressure sensor, which will, in turn, be used to calibrate the airspeed indicator. The calculation of a pressure altitude will be used to correct for the ISA dependencies.

Project Area: Sensor Technology
Project Technology: C/C++

Project Number: 189
Project Title: Modelling of Fluid Structure Interaction Problems using the ANSYS Workbench.
Name: Alec McMahon
Email: alec.mcmahon36@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: Bryan.MacDonald@dcu.ie

Demonstrates and documents the process of creating a 1-Way Fluid Structure Interaction Problem using the ANSYS Workbench. The structural effects of multiple airflow speeds over an industry standard 1.5MW 35m wind turbine blade are analysed. The deflection of the blade as well as the stresses induced for each airflow speed are found. Blade geometry is produced and modelled accurately to real world wind turbine blade, including multiple layers of composite materials with varying thicknesses along the length of the blade.

Project Area: 3-D Modelling, Finite Element Analysis, Fluid Mechanics, Simulation
Project Technology: ANSYS Workbench, Solidworks
Project Number: 190

Project Title: HeadCount: An NFC Attendance Tracker
Name: Amy Leitch
Email: amy.leitch2@mail.dcu.ie
Programme: Computer Applications
Supervisor: Stephen.Blott@dcu.ie

This project streamlines the process of keeping attendance at events, such as college lectures/meetings. No more lists of names, places, or time wasted on taking attendance. A simple Tap-and-Go between mobile application and NFC tag, with minimal configuration necessary. Collected data is displayed on an organised web interface.

Project Area: Android, Databases, Information Retrieval, Mobile App, Web Application, Wireless Technology
Project Technology: CSS, HTML5, Java, JavaScript, Firebase

Project Number: 191

Project Title: 'MozAlrt - Music Learning Neural Network'
Name: Seán Hutchinson
Email: sean.hutchinson5@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

'MozAlrt’ tackles the challenges of AI in art by attempting to compose music. It utilises novel methods of data representation to turn a collection of music into a dataset to train a neural network. Riding the wave of neural networks’ renewed prominence in AI, ‘MozAlrt’ utilises the ‘Long Short-Term Memory’ model to retain information during its writing process, allowing it to “remember” features throughout the output. This results in a song that has consistent and coherent themes and patterns throughout.

Project Area: Artificial Intelligence
Project Technology: Python

Project Number: 192

Project Title: Thermal Control System
Name: Shane Bannon
Email: shane.bannon3@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Harold.Esmonde@dcu.ie

Rheometers are used to measure the dynamic mechanical behaviour of liquids and soft solids. Values obtained are highly sensitive to temperature. Therefore measurements are conducted under carefully controlled conditions. The Peltier’s thermoelectric effect is used to provide cooling or heating as required in a squeeze film rheometer. An arduino uno and a h-bridge circuit are used to regulate power to the heat pump in response to a signal from a thermistor placed in close proximity to the sample under test.

Project Area: Arduino, Control Systems, Mechatronic Systems, Sensor Data, Simulation
Project Technology: Matlab, Simulink, Solidworks
**Project Number: 193**

**Project Title:** Trouve - Area Advisor  
**Name:** Eoin Magner  
**Email:** eoin.magner3@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Donal.Fitzpatrick@dcu.ie

Trouve is an area adviser, providing detailed analysis of an area to interested parties such as realtors and house hunters. The project aggregates data from multiple sources to allow the user to come the most informed opinion about the area. The data is wide ranging from primary demographic in an area, to amenities in the region, to number of Irish language speakers.

**Project Area:** Web Application  
**Project Technology:** REST, Elasticsearch, AngularJs/ReactJS

**Project Number: 194**

**Project Title:** Experimental Dynamic Protocol for the Simulation of Spinal Burst Fractures  
**Name:** Oisín Carr  
**Email:** oisin.carr4@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Nicholas.Dunne@dcu.ie

The aim of this project was to generate thoracolumbar burst fractures within synthetic and natural vertebrae samples using a drop-weight test method. This involves dropping a known weight from a specific height onto the sample. This technique attempts to re-create the dynamic conditions of a real life burst fracture, and the potential and kinetic energies necessary for fracture generation can be examined. Different types of fracture can then be classified according to established classification methods.

**Project Area:** Biomedical Engineering  
**Project Technology:** Solidworks

**Project Number: 195**

**Project Title:** CoderDojo Universal Login  
**Name:** Suzanne Campbell  
**Email:** suzanne.campbell25@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Brian.Stone@dcu.ie

My project is for the CoderDojo Foundation. This project migrates CoderDojo’s Zen platform to become an OAuth provider allowing third-party applications access to CoderDojo’s API on behalf of a registered CoderDojo user.

**Project Area:** Software Development  
**Project Technology:** CSS, Docker, Node.js, REST, MySQL, JavaScript, PostgreSQL, VueJS
**Project Number: 196**

**Project Title:** UniPay  
**Name:** Jack Ryan  
**Email:** jack.ryan89@mail.dcu.ie  
**Name:** Oran Lawton  
**Email:** oran.lawton2@mail.dcu.ie  
**Programme:** Enterprise Computing  
**Supervisor:** Paul.M.Clarke@dcu.ie

UniPay is a mobile payment system that has been developed to provide third level students across the country with a virtual wallet that allows them to store their payment card details on their smartphones and make smart and secure payments in retailers throughout the various third level campuses across Ireland.

**Project Area:** Android, Mobile App, Wireless Technology  
**Project Technology:** Java, SQLite

---

**Project Number: 197**

**Project Title:** Memorability Toolkit  
**Name:** Laura Araviciute  
**Email:** laura.araviciute2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Alan.Smeaton@dcu.ie

The project has explored electroencephalographic (EEG) signals in alpha, beta, theta, delta and gamma wavebands to determine levels of memorability so that it’s users can redress forgetfulness. An Android application connects to a Muse brain-sensing and analyses states of memorability by presenting a user with a video. Moments of lost concentration which lead to forgetfulness are captured to provide the user with a reinforcement tool in the form of a personalized recap of the video.

**Project Area:** Wireless Technology, Mobile App, Statistical Analysis, Image Video Processing, Data Mining, Data Analytics, Android, Wearable Technology  
**Project Technology:** Excel/VB, Android SDK, Muse Brain Sensing Headband SDK, KNIME Analytics Platform, Firebase, Java

---

**Project Number: 198**

**Project Title:** Design of a Novel Medical Device to Aid the Delivery of Enduragel™ in the Treatment of Cerebral Aneurysms  
**Name:** Jennifer Daly  
**Email:** Jennifer.daly36@mail.dcu.ie  
**Programme:** Biomedical Engineering  
**Supervisor:** Owen.Clarkin@dcu.ie

This project explores the design of a novel device, which overcomes problems associated with delivery of Enduragel™ to cerebral aneurysms. The device must employ a porosity which restricts flow of Enduragel™ and allows flow of blood at a specific rate. A test was designed to measure the flow rate flux of solutions similar to blood and Enduragel™ through materials with predefined porosities. A range of porosities which meet the required flow rate flux criteria of blood and Enduragel™ were determined.

**Project Area:** Biomedical Engineering  
**Project Technology:** Excel/VB, Solidworks, Practical Fluid Flow Rig
Project Number: 199

Project Title: Job Analytics
Name: Daniel O’Sullivan
Email: daniel.osullivan42@mail.dcu.ie
Programme: Computer Applications
Supervisor: Suzanne.Little@dcu.ie

This project attempts to make the hiring process for both employers and applicants easier. It is a job posting web application created with the Django web framework. The application will read an applicant’s CV and return how qualified that person is for the applied role based on the requirements specified as well as predicting how well that person will perform in the role using machine learning. For applicants, they can upload their CV to see what job postings they match.

Project Area: Statistical Analysis, Web Application, Data Analytics, Natural Language Processing
Project Technology: HTML5, JavaScript, JQuery, Python, SQL, Django Web Framework, CSS

Project Number: 200

Project Title: DCU Personal Assistant Chat Bot
Name: Ian Kelly
Email: ian.kelly7@mail.dcu.ie
Programme: Computer Applications
Supervisor: Gareth.Jones@dcu.ie

The DCU Personal Assistant Chat Bot is a web app designed with the purpose of aiding DCU students. The student will be able to ask the bot a question, the bot will utilize natural language processing methods to determine what the student is asking, and then respond with the appropriate information. This information will include but is not limited to the time of their next lecture and when their next bus will arrive.

Project Area: Natural Language Processing, Web Application
Project Technology: JavaScript, Node.js, REST, Luis

Project Number: 201

Project Title: Design of a disposable cartridge for RapiPlex Diagnostic Reader capable of testing for six Analytes
Name: Thomas Walsh
Email: thomas.walsh47@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Brian.Corcoran@dcu.ie

This project was taken in collaboration with Biosensia, a late stage, pre-commercial medical device start-up, and involves the design of a multiplexing disposable cartridge for use in their diagnostic platform, RapiPlex. The cartridge must be low cost, simple to manufacture and capable of testing for six different analytes simultaneously. Through the research and development of the cartridge, a design with a CV% value of less than 10% was achieved for the readings across the six strips.

Project Area: Biomedical Engineering, Device Design, Fluid Mechanics, 3-D Modelling
Project Technology: Solidworks
**Project Number: 202**

Project Title: MySpend  
Name: Claire-Anne MacDonagh  
Email: claireanne.macdonagh5@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Ray.Walshe@dcu.ie

MySpend enables users to monitor their spending patterns and aid budgeting. It is an android app that accurately extracts relevant data from receipts and invoices by efficiently storing and categorising this data to keep track of expenses on the go. MySpend analyses the retrieved data to help users to manage and plan how, when and where they spend their money.

Project Area: Software Development, Android, Computer Vision, Mobile App, Optical Character Recognition  
Project Technology: XML, Java

**Project Number: 203**

Project Title: Rey-Osterrieth Test for iPad  
Name: Jesse Balfe  
Email: jesse.balfe3@mail.dcu.ie  
Programme: Computer Applications  
Supervisor: Suzanne.Little@dcu.ie

This project is an app that allows the Rey-Osterrieth complex figure (ROCF) neuropsychological test to be taken on an iPad and scored automatically. The scoring is done by a convolutional neural network created with the TensorFlow framework and trained with copies of the test provided by Beaumont Hospital. The ROCF test involves reproducing a complex diagram and is used for a wide variety of patients. The goal is to reduce the time doctors spend manually marking paper copies of the test.

Project Area: Mobile App, Intelligence Pattern Matching, Artificial Intelligence  
Project Technology: Python, Swift

**Project Number: 204**

Project Title: Searchee  
Name: Scott Dermody  
Email: scott.dermody3@mail.dcu.ie  
Name: Jordan Hughes  
Email: jordan.hughes27@mail.dcu.ie  
Programme: Enterprise Computing  
Supervisor: Jane.Kernan@dcu.ie

Searchee can be best described as a new electronic goods comparison search engine that tackles the issue of searching multiple sources for product and price comparison by combining them all on one website making it easier for the user. It adds the feature of location based results which not only save the user’s time in receiving their product but gives local Irish retailers the advantage against online international websites.

Project Area: Web Application  
Project Technology: CSS, HTML5, JavaScript, MySQL, PHP, SQL
Project Number: 205
Project Title: Passive NFC Environmental Sensor
Name: Niall Quirke
Email: niall.quirke3@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Conor.McArdle@dcu.ie

For many IOT applications it’s desirable to collect environmental sensor data without power supply or network connection. The aim of this project is to develop a passive Near Field Communication (NFC) sensor which can be permanently installed in locations without power supply or network connection and then read periodically via an NFC-enabled smartphone Android application. The project will involve designing an NFC 13MHz inductive loop circuit, a very low-power microcontroller with sensor hardware/software system, smartphone user-interface and NFC interface software.

Project Area: Internet of Things
Project Technology: C/C++, DSP

Project Number: 206
Project Title: LangAssist
Name: Rory Byrne
Email: rory@metro.exchange
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

This project attempts to help users learning a language. It tracks and displays a user’s day-to-day use of a language and the mistakes they make, and uses that data to assist the user by highlighting difficult words, suggesting improvements when typing and other things. As a bonus, it can guess a user’s native language based on their writing in English. Data for the system is gathered using Metro, a data crowdsourcing platform also created by Rory outside of this project.

Project Area: Web Application, Cloud Computing, Artificial Intelligence, Natural Language Processing
Project Technology: HTML5, JavaScript, Python

Project Number: 207
Project Title: Real-time “privacy at source” computer vision system
Name: Radwan Duadu
Email: radwan.duadu2@mail.dcu.ie
Programme: Electronic and Computer Engineering
Supervisor: Paul.Whelan@dcu.ie

The aim of the project is to generate privacy at source, i.e. The system will comprise of a simple intelligent computer vision system e.g. based on the raspberry pi connected to a standard camera. The aim is to automatically detect and apply privacy protection to all facial features captured at source using this device. The device must be capable of operating in real-time.

Project Area: Security, Image Video Processing, Computer Vision
Project Technology: Python, opencv
Project Number: 208
Project Title: Air Flow Plate for a Hydrogen Fuel Cell
Name: Stephen Murphy
Email: stephen.murphy295@mail.dcu.ie
Programme: Mechanical and Manufacturing Engineering
Supervisor: James.Carton@dcu.ie

This project looks at a proton exchange membrane fuel cell. The project is looking at the design of air flow plates to optimize the performance of the fuel cell. The project uses Solidworks to design the flow plates and ANSYS workbench to model the flow through the plates. The pressures and velocities of the flow through the plates are analysed to determine the optimum flow plate design.

Project Area: 3-D Modelling
Project Technology: Solidworks, ANSYS Workbench

Project Number: 209
Project Title: Bamboozle: Fraud Detection Web Application
Name: Niamh Byrne
Email: niamh.byrne53@mail.dcu.ie
Programme: Computer Applications
Supervisor: Jennifer.Foster@dcu.ie

Bamboozle is a web application which is designed to provide a fraud detection service to users. It aims to detect whether product reviews and URLs are fraudulent or not. The application uses data mining classification techniques to classify the data submitted by users.

Project Area: Data Analytics, Data Mining, Web Application
Project Technology: CSS, Eclipse, HTML5, Java, JavaScript, WEKA

Project Number: 210
Project Title: Design of a Virtual Reality Interface to Solidworks using the Unity Game Engine
Name: Bruce Davidson
Email: bruce.davidson2f@mail.dcu.ie
Programme: Mechatronic Engineering
Supervisor: Noel.Murphy@dcu.ie

The Unity Game Engine provides powerful and well-supported Virtual Reality viewing modes. Solidworks is a well-known computer aided design software for the development and prototyping of mechanical parts and assemblies. The purpose of this project is to design a virtual reality interface for assemblies generated with Solidworks to create a realistic representation of prototypes. Interaction with the virtual objects is completed with the Arduino microcontroller giving the user the ability to control the virtual object.

Project Area: 3-D Modelling, Arduino, Virtual Reality
Project Technology: .NET, C#, Solidworks, Unity
**Project Number: 211**

**Project Title:** Quest  
**Name:** Tríona Barrow  
**Email:** triona.barrow2@mail.dcu.ie  
**Programme:** Computer Applications  
**Supervisor:** Renaat.Verbruggen@dcu.ie

Quest is a top-down exploration game, with emphasis on adventure, puzzle solving and getting through obstacles in the player’s way. It has been developed for the Windows platform using C# within the Unity game engine. The player follows the story to finish quests in a rogue-like manner to discover more about the world and people around them.

**Project Area:** Gaming, Software Development  
**Project Technology:** C#, Unity

---

**Project Number: 212**

**Project Title:** Robotic Vision-Controlled Automated Packing System  
**Name:** Osama Hammad  
**Email:** osama.hammad2@mail.dcu.ie  
**Programme:** Mechatronic Engineering  
**Supervisor:** Paul.Welton@dcu.ie

The project involves the use of a robotic manipulator and a camera to develop an intelligent automation system which performs automated packing. This is achieved by capturing an image scene, using image processing and analysis tools to decide the position of each item within the presented packing region for a space efficient result, sending the information to a microcontroller to control a robotic manipulator and taking images between packing each item for real-time feedback.

**Project Area:** Automation, Lean Manufacturing, Mechatronic Systems, Robotics, Computer Vision, Image Video Processing  
**Project Technology:** C/C++, Matlab

---

**Project Number: 213**

**Project Title:** Electroluminescence and Efficiency Measurements in Photovoltaic Cells  
**Name:** Shatha Al Siyabi  
**Email:** shatha.alsiyabi2@mail.dcu.ie  
**Programme:** Electronic and Computer Engineering  
**Supervisor:** Patrick.McNally@dcu.ie

The most common Photovoltaic (PV) cells consist of silicon PN junction devices which transform solar radiation energy into electrical energy. A related phenomenon, called electroluminescence (EL), occurs when the PN junctions are forward biased and the generated electron-hole pairs recombine to emit light. The project investigates the use of simple webcams for monitoring and mapping the EL behaviour of PV cells and correlating these EL maps with electronic measurements such as open-circuit voltage and short-circuit current data at various temperatures.

**Project Area:** Power Electronics  
**Project Technology:** Scientific/engineering measurements and instrumentation design
Project Number: 214

Project Title: Magic Card Price Predictor
Name: Conor Smyth
Email: conor.smyth44@mail.dcu.ie
Programme: Computer Applications
Supervisor: Martin.Crane@dcu.ie

The goal of the project is to perform statistical analysis on the price history of Magic The Gathering trading cards to see if there are any existing trends which can be used to predict the price of cards in the future. The project consists of a website which provides a nice user experience to search and view price predictions of MTG cards, as well as a report of the statistical analysis findings.

Project Area: Statistical Analysis, Software Development, Data Mining, Data Analytics
Project Technology: CSS, HTML5, JavaScript, Python

Project Number: 215

Project Title: The Design of a Low-Cost Spirometer for use in Monitoring Respiratory Diseases
Name: Eoghan Hamill
Email: eoghan.hamill2@mail.dcu.ie
Programme: Biomedical Engineering
Supervisor: Tanya.Levingstone@dcu.ie

Spirometry is a crucial pulmonary function test used for the diagnosis and monitoring of respiratory diseases such as COPD and asthma. However, the key component of a Spirometry test, the spirometer, is an expensive piece of equipment and diseases such as COPD are particularly prevalent in poorer, developing countries. Therefore, for this project a low-cost spirometer was designed and manufactured using 3D-printing technology.

Project Area: Device Design, Biomedical Engineering, Additive Manufacturing
Project Technology: LabVIEW, Solidworks

Project Number: 216

Project Title: Skynet
Name: Conor Flynn & Jack Smith
Email: conor.flynn38@mail.dcu.ie
Name: Sean Healy & Mladen Kajic
Email: sean.healy33@mail.dcu.ie
Name: Conor McManus
Email: conor.mcmanus24@mail.dcu.ie
Programme: Computational Problem Solving and Software Development
Supervisor: Jennifer.Foster@dcu.ie

Skynet is a neural network framework which creates multi-layer perceptrons and convolutional neural networks along with a website which can create, run and visualize the performance of created models. The networks can be run on common problems and datasets such as digit recognition with MNIST and sentiment analysis with IMDb movie reviews. The core of Skynet is written in Java, with some GPU optimizations in OpenCL. The site was created with Ember.js with communication handled by Jersey/Jackson.

Project Area: Artificial Intelligence, Software Development
Project Technology: Java, JavaScript
Project Number: 217
Project Title: Advanced design & analysis of an Si-based modulator
Name: Tom Pellerin
Email: tom.pellerin2@mail.dcu.ie
Programme: Study Abroad (Engineering & Computing)
Supervisor: Pascal.Landais@dcu.ie

The aim of the project was to design a simulator of an electro-optical modulator based on a diode using Matlab. To achieve this project, I decided to use a 1D drift-diffusion model to simulate the behaviour of a pn junction. It was decided to choose the LU decomposition as numerical method, and the Scharfetter-Gummel discretization. At the end, I was able to design the simulator at the equilibrium, but problems were identified concerning the application of a voltage at the anode of the pn junction.

Project Area: Optical Communications
Project Technology: Matlab

Project Number: 218
Project Title: Detection of trace-gas molecules using an optical dual comb architecture
Supervisor: Prince.Anandarajah@dcu.ie
Name: Alejandro Jaimez Garcia
Email: alejandro.jaimezgarcia2@mail.dcu.ie

The main goal of this project is the detection of trace-gas molecules in real world applications with the purpose of improving detection sensitivity in the part per billion range. Moreover, it is necessary to identify a few different wavelengths bands of interest, simulate with VPI to develop dual-comb architectures a suitable receiver and referencing circuit designs, implement DSP to enhance the sensitivity and the final classification of the gas species and finally compare the sensitivity improvement against standard techniques such as CE spectroscopy and FTIR.

Project Area: Optical Communications, Digital Signal Processing
Project Technology: Other - VPI, Digital Signal Processing

Project Number: 219
Project Title: Contextual information for speech recognition
Supervisor: Kevin.McGuinness@dcu.ie
Name: Alejandro Woodward
Email: alejandro.woodward3@mail.dcu.ie

The focus of this project is speech recognition, more specifically in “large vocabulary continuous speech recognition” (LVCSR). The problem addressed in this project is building a system that can transcribe speech from a wide variety of videos (news, interviews, sports, etc.) using information from the context of these videos. A Deep Speech Recurrent Neural Network is fine-tuned, the context is extracted from videos, language model training is carried out and a Beam Search decoder is used for final implementation checking.

Project Area: Artificial Intelligence, Natural Language Processing, Speech Recognition,
Project Technology: Other
**Project Number: 220**

**Project Title:** Narrative Clip  
**Supervisor:** Cathal.Gurrin@dcu.ie  
**Name:** Adria Alsina Torra  
**Programme:** Study Abroad (Engineering & Computing)  
**Email:** adria.alsinatorra2@mail.dcu.ie

This project focusses on one of the life log tasks purpose by LSC (lifelog Search Challenge). These core tasks aim to advance the state-of-the-art research in life logging as an application of information retrieval. This project uses LSC data that consists of at least 4 weeks of data from two active lifeloggers. The development identifies different elements of an image and is able to identify what the image is about. A diary is constructed from the information.

**Project Area:** Information retrieval  
**Project Technology:** Matlab, Python

**Project Number: 221**

**Project Title:** An investigation into the importance of time and order in the evaluation of visual attention models  
**Supervisor:** Kevin.McGuinness@dcu.ie  
**Name:** Marta Coll Pol  
**Programme:** Study Abroad (Engineering & Computing)  
**Email:** marta.collpoll2@mail.dcu.ie

The focus of this project is image processing on iSUN datasets so that the saliency model’s performance is improved. Initially examples of images are identified where fixation’s time and order seem important. A deep learning model, implemented in Python, (MLNet) is used to improve an existing model trained for saliency prediction by adding temporal information. A new metric is created and applied to evaluate the new model’s predictions.

**Project Area:** Artificial Intelligence, Image Processing  
**Project Technology:** Other
Got Tech? Get TechCentral.

Ireland’s daily source for technology news, insight and opinion
Many thanks to the following companies for sponsoring prizes:

OPENET

OPENET is one of the largest privately-owned software companies in Ireland. The ambition and vision of Openet’s senior team including, Founder and CTO Joe Hogan and CEO Niall Norton, has been essential to the organisation’s continued success. Openet has more than 80 customers in 32 countries. Openet is headquartered in Dublin with offices in United States, Malaysia and Brazil giving scope to travel and work, live and enjoy new cultures and locations.

A significant number of Openet staff are DCU graduates, according to Joe Hogan, a graduate of DCU’s B.Sc. in Computer Applications (1989) and the 2018 DCU Alumni Award winner for Technology and Innovation. “Openet has long recognised the calibre of graduates produced by DCU, particularly from the Faculty of Engineering and Computing. More recently, we have been working to strengthen the relationship links between Openet and the University. We are keen for DCU students to view Openet as an employer of choice when they graduate”.

Openet provides Digital Business Platform in the form of software solutions and services to enable service providers to create new revenues from digital services and improve customer engagement. This enables service providers to be more agile, innovative and enjoy a faster time to value. Such demands for innovation still lead the industry, easily processing more than 10 billion daily network transaction records at a single network operator.

Since its foundation in 1999, Openet has been at the forefront of telecoms software development and innovation. Our success is personified by the many long-term relationships it has fostered with the largest, most progressive, and demanding operators across the globe.

For more information see: www.openet.com

Fidelity

Fidelity Investments is one of the world’s largest providers of financial services. Founded in Boston in 1946, our goal is to make our financial expertise broadly accessible and effective in helping people live the lives they want. At Fidelity Ireland, we provide middle and back office support to our business partners and design, build and implement technology that maintains Fidelity’s continued global success. We harness our cutting-edge technology capabilities and resources to continuously innovate in ways that create better outcomes and experiences for our customers.

At Fidelity Investments Ireland we offer two exciting training and development programmes for new graduates:

- Our Leap programme is designed to accelerate the development of recent IT graduates to become best-in-class IT professionals. The six month programme starts each September and upon completion of the training, graduates are placed in dynamic roles across Fidelity’s diverse technology project teams in Dublin or Galway.
Our new Financial Services Operations graduate programme, Grow, provides a springboard for graduates to launch their career in a global Financial Services organisation. This training programme focusses on global Financial Services Operations combined with tailored domain training across a number of operational units.

At Fidelity Investments, you’ll discover exciting challenges as you develop professionally and explore career paths based on your interests and abilities. The organisation rewards ambitious, talented individuals with a work environment that fosters teamwork and collaboration while encouraging innovative ideas and fresh thinking.

Discover more at: [www.fidelityinvestments.ie](http://www.fidelityinvestments.ie)

---

**FINEOS**

FINEOS Corporation FINEOS is a market leading provider of core systems for Life, Accident and Health insurance. We are headquartered in Ireland, with offices also based in North America, Europe and Australasia. Underpinning the FINEOS success story is the dedication and creativity of our people, many of whom first joined FINEOS as graduates and have gone on to become experts with our organisation. Our graduates are core to the growth and continued success of FINEOS.

We are always seeking IT and Business graduates to join our team as Developers, Testers, Consultants and Interns. Indeed, our founder and CEO, Michael Kelly, is a graduate of Computer Applications in DCU. Working as a Graduate in FINEOS provides an excellent opportunity for you to acquire real-world experience of the software industry. FINEOS offers comprehensive training for all graduates geared towards long term career progression and personal development.

Based in EastPoint Business Park, Dublin 3, we offer a great work environment with flexible working, monthly sports and social club events, scrum areas, exercise and games rooms.

Discover more at: [www.fineos.com](http://www.fineos.com)

---

**Davy Group**

**Who are we**

Davy is Ireland’s leading provider of wealth management, asset management, capital markets and financial advisory services. For over 90 years, at Davy we have consistently adapted and innovated to deliver exceptional results for our clients, and in doing so we have gained a reputation as one of Ireland’s leading companies. Our purpose is to make a meaningful contribution to our clients by providing timely advice and investment outcomes of superior quality. As a result, clients will reward us with long term value creating relationships which will allow Davy to grow, staff to enjoy success and our stakeholders to achieve their goals. The Davy Group is headquartered in Dublin with offices in London, Belfast, Cork and Galway and employs over 700 people.
### Graduate Technology Programme

Technology is at the heart of everything we do for our clients. As a graduate working in the Information Systems team, you will work with over 65 other IT professionals to design and deliver the systems that help to run our business. Our two year programme will give you the opportunity to acquire professional accreditations and work in multiple teams & projects to understand our business & technologies. Our team has a very diverse skills profile, from software developers, network engineers, database administrators and business analysts to system administrators, IT security specialists and project managers. Davy provides a challenging environment where you can develop your technical and professional skills with the guidance and assistance of a knowledgeable, professional and energetic team. Whatever your interests and career aspirations, Davy can provide an environment where you can grow and broaden your understanding of how Information Technology can deliver value to businesses.

Based in Dawson Street in Dublin city centre, we offer a great work environment with fantastic on-site facilities, such as our on-site gym and fitness studio. We have a very active sports and social scene, which will help you to integrate into the overall Company, so whether you are interested in Urban Fitness, TRX, Pilates, Yoga, Wine Tasting, French language lessons, golf, 5-a-side football, or something different, there is something to suit all tastes.

At Davy, we recognise the importance of continuous learning. To this end, we encourage our staff to pursue self-development opportunities through the acquisition of professional qualifications, formal training and active on-the-job coaching. Davy also invests in your personal development, offering a range of in-house seminars on a variety of topics such as emotional intelligence, persuasive communications, and mindfulness.

For more information see [www.davy.ie/careers/graduates](http://www.davy.ie/careers/graduates)

### IBM

We’re the largest IT and consultancy company in the world. We employ over 430,000 people in over 170 countries. We’re a company that fosters inventors and innovators, that not only empowers our employees to dream but equips them to deliver... From the PC, the memory chip, and the calculator to NASA technology that saw man land on the moon, to super computers that beat the world chess champion and Jeopardy champions, ...we’ve been powering world firsts for over 100 years.

IBM Ireland Lab is one of IBM’s largest R&D Labs outside of the US. We are located at three sites – Dublin, Cork and Galway. Our Dublin site is located at our 100 acre Technology Campus in Mulhuddart, which is IBMs largest campus in Europe and home to a broad range of IBM missions. At IBM Ireland Lab, more than 1700 software professionals use innovative technologies to design, build, deploy, test and support, solutions for IBM’s global customer base, across our core solution strategies of Cloud, Analytics, Mobile, Social and Security.

We hire a large number of graduates every year across our Development, Technical Support and Cloud Operations teams. Come work for IBM and build your portfolio while working on some of society’s most pressing issues.

For further information, please contact:

Christine Stears
Faculty of Engineering and Computing
Dublin City University
Dublin 9

Tel: +353 (0)1 7005237
Email: Christine.Stears@dcu.ie
Web: www.dcu.ie/computing

Many thanks to our main sponsor:

Prizes sponsored by:

SAP

Many thanks to our media supporter: