CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

DEPARTMENT OF COMPUTING

4TH YEAR PROJECT SHOW

James Barry Exhibition Centre - May 11th - 16:00 - 20:00

2016

I'm delighted to invite you to the 2016 undergraduate degree show for the Department of Computing at Cork Institute of Technology. The show will be held on Wednesday May 11th from 16:00 to 20:00 in the James Barry Exhibition Centre at the Bishopstown Campus.

On display will be final year project poster presentations by students from our honours degree programmes. The projects on display demonstrate the quality of CIT Computing graduates and their ability to solve real world problems.

Please join us on the day for what promises to be a great celebration of our students' achievements.

Tim Horgan, Head of Department

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Student Name: Barry Fitzgerald	**Supervisor:** Paul Rothwell
Project Title: Vehicle Management System and Mobile Application	
Research Question: Can the management of a vehicle service and sales organisation be made more efficient through the use of mobile and desktop software?	
Project Abstract: The vehicle industry has had a significant increase in productivity since late 2014. People are willing to spend on their car again. So how does a garage handle this increase in demand? This project will aim to allow the company to manage a customer, employee, product and vehicle database. It will allow the booking of appointments and the option to print invoices for the services. Salespeople will be able upload cars for sale to a database including a photo of the car for potential buyers of the vehicles. An associated mobile app will allow the customer to make appointments from the comfort of their own home, view the sales cars in stock that have been uploaded, and contact the business by email for any miscellaneous queries they may have.	
Technologies used: Everything is linked by a cloud database. Java, Hibernate, Spring, JasperReports, Android, PHP, MYSQL, Amazon AWS, Swing, WampServer.	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Jack Hanley	**Supervisor:** Paul Rothwell
Project Title: A mechanism to consolidate infrastructure patches and application deployments	
Research Question: How can we be fully confident in application deployments?	
Project Abstract: Application and infrastructure have inherent dependencies, but to date have typically been measured separately. This leads to inconsistent environments within the continuous delivery chain. This project will aim to consolidate the deployment techniques for both application and infrastructure and also provide a means to ensure the consistency of applications and patches across cloud environments. In the continuous delivery pipeline the application owner is not just responsible for their applications, but also responsible for their environments. Modern continuous delivery pipelines utilise multi-environments for development, testing, staging and production. Within the staging and production environments it is critical for their infrastructure properties to be aligned correctly. How do we ensure that they align?	
Technologies used: Java, Spring MVC, Apache HTTP Client, MySQL, Hibernate ORM, GSON/Jackson, Lombok, Angular.js, Maven, GitHub, Bluemix	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Robert James Gabriel	**Supervisor:** Dr. Donna O'Shea
Project Title: Web browser and Chrome extension with on the fly filtering and parent-child monitoring using machine learning algorithms, Node.js and Nw.js	
Research Question: Investigating/Developing the use of machine learning algorithms to improve on the false positive results in existing filtering/monitoring systems.	
Project Abstract: The object of the project is to investigate and develop a method of solving a common problem in existing filtering systems. Trying to understand better what websites to block and what not to block. An example of this is a difference between an adult site vs. a sexual education site, which currently the majority of filtering systems block both. The project has two parts, the first being a web browser built using several tools but most noticeable Node.js, Firebase, and the Naive Bayesian classifier algorithm. Within the browser, there is a series of functions that scrapes web pages the user visits. It checks each word and classifies either as profanity or not, along with how often individual words repeat. The dataset gathered from the web page is saved to Firebase, it's regularly updated to have a better understanding. The datasets are used with the Bayesian classifier algorithm to classify if the web page should be blocked based on the words we scrapped and classified. All this is done within seconds, and settings from the browser are synced to firebase. The second part is a Google Chrome Extension. The chrome extensions are made using mostly Angular.js, Node.js, and Firebase. The extension allows parents to see what your child is doing on the web. It also allows them to set white and black lists for custom filtering. They can see the information were using to classify the websites and disable the web browser there child is on at any time. Learn more at http://www.projectbird.com/robin	
Technologies used: Node.js, Angular.js, Npm, Less, Nw.js, Firebase, Chrome API, Html, Javascript and gulp.js	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Mark Lehane	**Supervisor:** Colin Manning
Project Title: Steam Time Tracker	
Research Question:	
Project Abstract: The purpose of this project is to help people better manage their time spent playing games through the Steam platform. The project aims to: - Allow users to monitor their time spent playing games. - View statistics about how long they play games. - Schedule times when they wish to play games. - Receive notifications via email/text once they have reached their time quota.	
Technologies used: IBM Bluemix, Twitter Bootstrap, PHP, HTML, CSS, JavaScript, Steam API, SteamAuthentication PHP Library	
Class: BSc (Hons) Web Development	

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Student Name: Jerry Murphy	**Supervisor:** Karl Grabe
Project Title: Space Invaders Android Application	
Research Question: Investigate game engine development on Android to develop a Space Invaders game.	
Project Abstract: The main goal of this project is to create a version of Space Invaders game for the Android platform and to allow players to customize the game which was not possible in previous versions of Space Invaders such as selecting different backgrounds and characters. The application also includes a leaderboard where players are added to upon registering on the application and is updated when a gamer gets a higher score than their current score and is sorted by highest to lowest score.	
Technologies used: Android native app development. Eclipse, SQLite, Samsung Galaxy Core Prime	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Robert Field	**Supervisor:** Karl Grabe
Project Title: Darts score calculator and league display	
Research Question: Develop a mobile app to manage dart leagues.	
Project Abstract: This project is aimed at small organisations that are set up around local dart leagues. The main goal is allow dart players quick access to the dart leagues that they play in as well as let the admins controller who is in the league and the results of matches. There is also a second part to the application that allows the users to just click on the screen and allow the app to do the calculations for them. This is to help new users to the game understand the scoring of the game and allow older the players to keep track of their score when playing by themselves or in a practice situation. Both players and admins will see benefits from this as players will be able to quickly submit match scores as well as admins will have control of the league directly from their phone.	
Technologies used: Android native app development, Android Studio, Butterknife, Samsung S6, Samsung Tab4	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Edmond Donegan	**Supervisor:** Karl Grabe
Project Title: ETimes - Employee management Mobile App	
Research Question: Use of Generic Objects and Methods	
Project Abstract: This project is aimed at small businesses and part-time employees. The main goal is to help young part-time employees to organise their time more efficiently by allowing them to get quick and up-to-date information on their working hours, expected pay gross and net,employee rights as well as contact information for other employees and employers in their job and more. Employers also benefit from this project as it will allow them to quickly view all their employee contact details, the employee's working hours, the cost of each employee for a particular day as well as the ability to add, remove and edit their current employees and more.	
Technologies used: Android native app development, Java server sockets, Raspberry Pi 2 server hosting a MySQL database, running Linux, FreeDNS, Samsung Galaxy S5	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Avril Constant	**Supervisor:** Paul Rothwell
Project Title: Internet of Things App.	
Research Question: How do we disseminate the knowledge and understanding of the Internet of things in today's society?	
Project Abstract: This project implements a mobile application quiz with a number of questions in relation to the Internet of Things. When the user completes the quiz the application will create a promotion code. This code will allow the user to enter a T-shirt website and purchase a personalised T-shirt at a reduced cost. The Mobile application quiz is created with Android Studio. On entering the quiz the user will be prompted to enter a username and password. If the user has entered the correct details a new activity will launch with the first question. If the user enters incorrect details they will have four further attempts before being blocked on entering the quiz. Once the quiz question has appeared the user will then answer by selecting either a true or false option. If the answer selected is correct the application will launch another activity. If the user does not select the correct answer for question one, question two will appearing allowing the user to have a second chance at winning the code. If the user answers this question incorrectly also the application will then end. The third activity launched will provide the user with details on how to claim their prize whilst also providing the user with a direct link to the necessary website. The user will be given a code which will be used as a discount method on a T-shirt website which has also been created as part of the project. On entering the website the user will be greeted with a cookie message allowing the system to remember the user's name for future visits. The user can then create a personalised T-shirt and preview each change made whether it is colour or imaging. Once payment details have been entered the user will then be advised to enter a voucher code which will enable the user to purchase the T-shirt at a reduced price.	
Technologies used: Android Studio	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Kieran Moroney	**Supervisor:** Dr. Donna O'Shea
Project Title: Temperature recording application to ensure compliance for sea vessels catching and storing fish.	
Research Question: Recording temperature for freezers according to fishing standards	
Project Abstract: Each fishing standard has different things that is required from a fishing vessel and currently all records are stored in record books and can easily be lost. The aim of this project is to take the pressure and responsibility away from the skipper, record all the temperature from a trip and allow the skipper to add other records such as whale and dolphin sightings. This project and software allows the skipper to have all their records in one location and also makes it much easier to synchronise all their information with the database on the web server for the purpose of compliance.	
Technologies used: Raspberry PI, Tablet, Android, Temperature Sensors, GPS antenna, PHP	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Libor Kampas	**Supervisor:** Paul Rothwell
Project Title: File Distributor: A System for Distribution and Safekeeping of Sensitive Files	
Research Question: What is Geofence Technology and how can Geofence technology be utilised?	
Project Abstract: 'File Distributor' is a Mobile application allowing for remote access to sensitive company data. This mobile application allows registered users to use their devices to access sensitive data. Data is tied to geographical locations using Geo-fence technology thus the data available to registered users is only that which is relevant to their work in a specified geographical location. The goal of the project is to minimize the risk of data leak, loss and misuse.	
Technologies used: Android Studio, PhpStorm, Putty, WinSCP, Subversion, Java, PHP and more	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Karl Walsh	**Supervisor:** Clíona McGuane
Project Title: Soft-trace Dashboard and traceability module	
Research Question: : Investigating and Developing a customizable dashboard and traceability module to improve the data visualizations and simplify complex data .	
Project Abstract: A business intelligence dashboard to keep track of key data points relevant to a customer. Using data visualisations and complex data sets to provide users an awareness of current performance at a glance. A quick and easy traceability section so that products and materials can be traced bi-directionally from raw material to finished product.	
Technologies used: Asp.net, C#, Visual studio 2010, IIS 7, SQL Server, JQuery	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Rokas Lukosevicius	**Supervisor:** Clíona McGuane
Project Title: Maintenance Processes Management System.	
Research Question: To develop software for easier access to, and management of, machinery maintenance processes to reduce errors and cut the overall costs for the maintenance of the plant.	
Project Abstract: To produce a system for people managing machinery in a manufacturing plant to have easy access to information relating to maintenance processes conducted on the machinery within the plant. The project uses the LAMP technology stack and Highcharts API to view the performance of the machinery. The system allows plant managers to record and manage maintenance processes as well as track the machinery performance over time. Such data helps managers to determine if another approach must be taken for maintenance processes to reduce the amount of errors being made for a given machinery, therefore reducing the overall maintenance costs.	
Technologies used: PHP, MySQL, AJAX, JavaScript, HTML, CSS, Bootstrap, Highcharts API	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Dillon Forde	**Supervisor:** Paul Davern
Project Title: 2D Platformer Game with Online Multiplayer created with Unity Game Engine	
Research Question: Investigate the suitability of WebGL for developing a 3D town building game.	
Project Abstract: The objective of the project was to investigate what goes into the development of a video game. For example, what video game engines to use, what programming languages, data structures, algorithms are commonly used. The game is playable in both single player and multiplayer and across multiple platforms. In single player there are two game types one is in the form of an endless level where the player is continuously being pushed forward and must jump between platforms and collect coins in order to get the highest score. The other game type is navigating through static levels and avoiding various enemies and obstacles in order to get to the end. The multiplayer only has on game type in which a player can join other players and race them to the end of one of the static levels that has been selected.	
Technologies used: Unity3D Game Engine, Unity Editor, C#, MonoDevelop	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Martin O'Driscoll	**Supervisor:** Dr Paul Davern
Project Title: Cloud Native Applications	
Research Question: Gamification - creation of a stock trading game	
Project Abstract: This project is in essence a stock trading game. Users are encouraged to buy low and sell high, making a profit on their transactions. Each user is allocated a balance on registration and the aim is to have the highest total. Users are informed of a shares trends over the last period to better inform their trades. They can see whether it has held steady or fallen/increased. The project is constructed in Java, using Spring Boot and a microservice architecture – splitting the application into a suite of small services that communicate with each other. For data storage, I have gone with a polyglot model, using both Redis and MongoDB depending on which best suits my needs. This project will be running on the cloud, on both BlueMix and Pivotal Web Services. This includes all data stores. To this end I am also utilising 3 Spring Cloud Projects – Config, Eureka and Hystrix, each with their own particular usefulness when developing cloud native applications.	
Technologies used: Java (Microservice Architecture), Spring Boot, Spring Cloud, Spring Data, MongoDB, Redis, Thymeleaf, Bootstrap, Bluemix, Pivotal Web Services, GitHub	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Gary O'Brien	**Supervisor:** Dr Paul Davern
Project Title: Barber Appointment Scheduling Application	
Research Question: Scheduling Algorithm for a barber shop	
Project Abstract: The goal of this project is to create a better customer experience in the barbering business by providing them with a way to make an appointment online for a specific barber shop. The customer can choose the barber they want the date and time. They can also choose if they want a specific drink waiting for them at the appointment and also if they want specific music playing. This will give a richer customer experience and will add value to the barber business. The customer will register online and once they are registered they can make appointments or they can ring the barber shop and do it over the phone. This system also provides the barber business with a mini staff system where the admin barber can register other staff members. What the barber can do on the system will depend on their role (Admin, Barber, Intern). This system will provide the customers and barbers with a more personal experience and will add more value to the barber business and attract new customers.	
Technologies used: Laravel (Php Framework), Angular JS, MySql, JavaScript Bootstrap, JQuery	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Michael Mahoney	**Supervisor:** Dr Paul Davern
Project Title: 3D HTML5 Town-Building Game	
Research Question:	
Project Abstract: Over the past few years the web has become home to some high quality games that run directly in the browser. Previously, web-based games were mainly flash or java-based and required plug-ins to run. Nowadays with the introduction of WebGL, games can run in the browser while directly using the graphics card. This project is an attempt at using the latest web technologies to create a 3D town-building game that requires the player to strategically plan and build a town that's both financially stable and pleasant to live in.	
Technologies used: HTML5, CSS, JavaScript, jQuery, BabylonJs, EasyStar.js	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Damien Ronan	**Supervisor:** Méabh O'Connor
Project Title: Vehicle Service Tracking Software System	
Research Question: Development of a vehicle service booking and tracking software system for a garage.	
Project Abstract: My main reason for creating software for a mechanics is from my experience in dealing with mechanics and seeing first-hand the tedious amount of paperwork they undertake. The purpose of the project is that a mechanic can book in customer vehicles for a service. The mechanic can fill out what was undertaken when servicing the vehicle, that data is stored in a MySQL database. The mechanic can view the previous service history of the customer's vehicle and also search the vehicle by registration or customer name.	
Technologies used: Java, MySql, JDBC	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Martin Twomey	**Supervisor:** Méabh O'Connor
Project Title: GP Software System	
Research Question: Development of a software system to make patient appointments and store appointment details and notes.	
Project Abstract: There are 1,300 General Practices in Ireland (eHealth Ireland, 2015) but there are only five certified GP software products. The goal of my project is to make a program that can match or improve some of the qualities of these software products. The purpose of the project is to develop an application in Java to facilitate the management of patient appointments and associated appointment details stored in a MySQL database. There are three types of users of the system, an administrator, a doctor and a secretary. The administrator can add, update and delete doctors and secretaries. A doctor can add/update/delete patients to the system, they can make appointments for these patients and record details of what happened at that appointment. A secretary can do similar things that a doctor can in that they can add/update/delete patients and make appointments. But the secretary can also record the payment from the patient after the appointment.	
Technologies used:	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: David Cahill	**Supervisor:** Méabh O'Connor
Project Title: Virtualisation, the next step	
Research Question: Setup and deploy a Kubernetes infrastructure and evaluate its ability to manage, cluster and monitor Docker containers	
Project Abstract: Kubernetes was first released in 2015 to the general public. It is described as an open platform for creating a clustered system from Linux containers. This will allow organisations to automate the control of these Linux containers with the use of Kubernetes. Docker is an open platform which uses Linux containers in order to run test automations and micro services within an organisation. This project aims to build the two together in order to create a Docker system which is controlled by the Kubernetes software. This project will build a fully functional Kubernetes infrastructure in a virtualized environment and monitor the infrastructure and data displayed in a visualised graph. The key functional aspects of the Kubernetes infrastructure will be tested and the results evaluated.	
Technologies used: VMWare workstation, Docker, Kubernetes	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Adrian Chambers	**Supervisor:** Noreen Gubbins
Project Title: Monitoring of high-availability IT services	
Research Question: How should high-availability IT services be monitored?	
Project Abstract: The success of an organisation can be attributed to the management of that enterprise. The motto “you can’t manage what you don’t measure” is very applicable to the management of high-availability IT services. This project provides an in-depth analysis of various monitoring techniques and investigates the service provider solutions that an organisation can deploy to assist in managing an organisation’s infrastructure. The project implements consolidated monitoring of high-availability IT services at a large multinational organisation, documents the results and evaluates the findings.	
Technologies used: Zabbix, VMware vCenter Configuration Manager, Syncplicity, Xymon	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Matthew Cooney	**Supervisor:** Noreen Gubbins
Project Title: An evaluation of Intrusion Detection and Prevention Systems in a Virtualized Network Environment	
Research Question: Which open-source IDS/IPS system should an organisation use?	
Project Abstract: An organisation's reputation depends on the security of its sensitive information and its ability to withstand attacks on its network from malicious sources. Securing the corporate network should be a top priority for every organisation. Having robust network security is of paramount importance and an effective intrusion detection and prevention system is essential. This project investigates Intrusion Detection and Prevention Systems and evaluates the open-source IDS/IPS options available. Two leading open-source IDS/IPS options, Snort and Suricata, were installed and configured in a virtualized network environment. These systems were tested by running a series of attacks on the network. The results were documented and the benefits and drawbacks of each outlined.	
Technologies used: Snort, Suricata, Snorby GUI	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Richard Costello	**Supervisor:** Dr Ruairi O'Reilly
Project Title: An Intelligent Investigation System into the root cause of Thermal Oxidiser Bypass	
Research Question: Can process management be simplified and made more efficient by automating the analysis of plant data to assist decision making in response to an event.	
Project Abstract: Managing processes within a pharmaceutical manufacturing plant combines multiple automated systems, a distributed control system and personnel from multiple fields. Identifying and reacting to events within these processes is a significant challenge for any engineering team. There is a huge amount of Process data, which can be complex and is gathered from multiple sources. The volume of this data makes organising and finding the corresponding event data a tedious and time consuming process that involves a significant amount of manual work. The project aims to develop a system to assist engineers in determining the root cause of a thermal oxidiser bypass by automating the analysis of data gathered from the plant at the time the event occurred. The system interfaces with a plant's distributed control system enabling it to gather data. Typically, this data is analysed in order to determine the cause of the event. The system consists of two parts: an automated response system that records plant data at the time of the event, generates a report and emails it to the engineering team; a web application that is used by the engineering team to visualise the data, configure and setup alerts for the detection of events.	
Technologies used: OPC Data Access 2.0, .Net Framework , C++, Microsoft SQL Server	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Peter Kovacik	**Supervisor:** Dr Ruairi O'Reilly
Project Title: A Content Management System for Cork Inline Hockey Club	
Research Question: Can a custom built CMS allow improved organisation and running of an inline hockey club?	
Project Abstract: The goal of this project is to design and implement a mobile responsive web based content management system for Cork Inline Hockey Club. Upon completion the project will go live and be used as the official website for the club. One aim of the project is to improve the organization of events, such as training sessions (time organisation, online notification of attendance), league fixtures (calendar of games being played during the season) and where the games will take place and what time) and inform users of team building activities. The system shall be used for maintaining records of game results, the relevant statistics of individual players such as points scored, attendance at training sessions, gallery of pictures and other pertinent information required for running a club. The system also provides unique email notifications for particular member which allows members to accept or decline session by clicking on link provided in email. Google maps of club venue shall be implemented.	
Technologies used: Spring MVC, Maven plugin, Spring Security, jQuery, Bootstrap, HTML, Tomcat Server, Linux Server, and MySQL.	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Richard Lynch	**Supervisor:** Dr Ruairi O'Reilly
Project Title: Parallel Data Analysis Tool for Genes	
Research Question: Can we significantly improve Genomic Sequencing tools using new database technologies?	
Project Abstract: The goal of this project is to test different database technologies in order to find which would perform best in processing large quantities of data. Data is consumed by databases at high speeds and often cannot be analysed as fast as it is being stored. An emerging trend in IT at the moment is Fast Data. Fast Data is the procedure of being able to process data at very fast speeds enabling the analysis of data as it is stored. Genomic data is one area which requires such technologies. Genomic data can contain large strings of DNA/RNA or protein sequences and in the field of Molecular Biology these sequences constantly need to be compared in order to find possible similarities. Comparing sequences can be exhaustive on a database system because it would involve querying large amounts of data at once. This can lead to performance problems particularly when traditional relational databases are being used to manage the genomic data. Relational databases were not designed to manage large amounts of data in a distributed manner. One of the major advantages of a NoSQL database is it's performance when processing large quantities of data in a distributed manner. As such, a number of NoSQL database technologies were investigated for processing and comparing the large quantity of genomic sequences data available. Three NoSQL database technologies have been selected for the investigation phase, Cassandra, Redis and Kafka. Each technology has differentiating characteristics in its approach to the processing and storing of data. One characteristics that can significantly improve performance is parallelism. This is achieved by enabling multiple tasks to be performed simultaneously which. This project aims to investigate if any major advantages can be realised when comparing the DNA/RNA and protein sequences using these database technologies.	
Technologies used: Redis, Apache Cassandra, Apache Kafka, Docker	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Michael Healy	**Supervisor:** Dr Ruairi O'Reilly
Project Title: Mobile Agitation Tracking (MAT) for cognitively impaired and dementia care subjects	
Research Question: Can vision recognition systems be used for the detection of agitation and can such systems form the basis of an early response warning system for patient care.	
Project Abstract: The MAT project aims to develop an initial set of algorithms that can detect restlessness and agitation generated aggression in dementia care subjects. MAT uses vision based analytics to track a subject's facial expressions in real-time. The MAT algorithms evaluates the facial expression data and provides alerts to staff and carers based on agitation related parameters. The first version of MAT has implemented the following two uses cases: Use Case #1 Restlessness Detection: Monitoring head movements for a given time period to detect if the subject may be in a restless state or not. Also provides per patient reports for carers. Use Case #2 Aggression Detection: Monitoring and tracking of specific facial landmark points to detect if a subject is showing signs of a violent outburst or abusive behaviour (i.e. shouting). The system also enables carers to receive cloud based alerts using a mobile application, which can be configured and triggered via use cases one or two. The user can also review information relating to previously alerts notified by MAT. The project has the potential to be used in more advanced machine learning and data analytics applications typically for research purposes on elderly care. Data sets for each subject's monitoring period are generated in CSV file format which could be used to populate a database or as inputs to machine learning classification algorithms/platforms.	
Technologies used: Intel Real Sense depth cameras, Real Sense SDK - C++, Android OS – Java, Google Cloud Messaging, Ubuntu Web Server Running PHP Scripts, MySQL	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Brian Walsh	**Supervisor:** Gerard Mac Sweeney
Project Title: Fashion Comparison Website	
Research Question: Can APIs for Retail sites be used so the user can search for the best price?	
Project Abstract: My website aims to give the user the best price based on the product they have searched for. I will be using eBay's API to return products listed on eBay's website and display them based on their prices. The website will be of simplistic design, inspired by Google Search's home page. This allows novice and experienced users to interact with the site with ease. The website features secure registration and log-in functionality with secure password management. The website shall be responsive, optimised for multi-device viewing (tablets, home pcs, smartphones.)	
Technologies used: C#. | ASP.NET MVC 4. | Razor. | JavaScript (JQuery). | CSS | SQL |	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Piotr Kawalec	**Supervisor:** Gerard Mac Sweeney
Project Title: An online e-commerce application	
Research Question: How utilisation of cloud platform enhances application lifecycle process?	
Project Abstract: The objective of the project is to demonstrate the use of Bluemix cloud platform to host an e-commerce application. For this purpose, the code will be developed locally and then deployed to the cloud. Following the deployment, supporting services will be bound to the application. For this application the main service is MySQL database which will serve the purpose of server side storage. The application itself is going to be an e-commerce solution that provides users with the possibility of placing personal advertisement online. It will be implemented in PHP programming language which will adapt model-view-controller pattern. It will interact with the user and display the results of his actions in the browser by use of HTML technology. The application will introduce new business model for the users which will allow them to place a number of advertisements for a fee as well as once off advertisements with no registration required.	
Technologies used: PHP, JavaScript, MySQL, CSS, HTML, JQuery, Bluemix	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Shay Forde	**Supervisor:** Dr Aisling O' Driscoll
Project Title: Global Shares Tracker App	
Research Question: How to develop a mobile application that will update the Global Shares Network based on customer travel patterns	
Project Abstract: Global Shares is a company that provides software for stock options and equity plan management. They wish to offer a mobile application to their customer that will track Global Share customer location and report this location to their backend services. Based on the user travel pattern, Global Shares can determine their tax status on their global stock portfolio. The goal project is to develop an Android App to record and pass updates to the network when a customer moves from one country to another to achieve this in a user-friendly and non obtrusive way.	
Technologies used: Android mobile technologies, Google Fused-Location API, RESTful API, SQLite	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Ren Kai Tam	**Supervisor:** Dr Aisling O' Driscoll
Project Title: Delta Blu	
Research Question: Is it possible to securely unlock a personal computer using Bluetooth to determine mobile proximity?	
Project Abstract: To prevent inadvertent security breaches and to facilitate quick and easy unlocking of personal devices, there has been increased interest in secure unlocking of devices based on physical device proximity. It is the goal of this project to provide a proof of concept that will allow secure unlocking a personal computer using Bluetooth from a mobile device. This will be based on the detected signal strength. A proof of concept based on the proprietary Windows 10 platform and the open source Ubuntu Linux will be investigated.	
Technologies used: Bluetooth, Android Development, Linux (shell) Ubuntu, J2ME, J2SE, Google Cloud Messenger, Python, PyBluez	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Shaun O' Donovan	**Supervisor:** Dr Aisling O' Driscoll
Project Title: FaceLog	
Research Question: How to provide users with centralized access to various login credentials via facial recognition	
Project Abstract: The FaceLog application provides users with centralized access to login credentials for various websites accessible using authentication based on facial recognition algorithms.	
Technologies used: KeyLemon, JavaScript, HTML5, AngularJS, BootstrapIO, Firebase	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Tom Meaney	**Supervisor:** Dr Aisling O' Driscoll
Project Title: Iris	
Research Question: How to securely handle medical data captured on a personal mobile device	
Project Abstract: This project addresses the issue of clinicians using their personal devices in their practice to capture sensitive medical data. It doesn't allow the data to be stored on the device and instead uploads it to a backend server. It also writes visible identifying patient information to each image and sound file captured to make sure that any misplaced data is traceable back to the patient and clinician.	
Technologies used: Spring, Hibernate, REST, Logback/SLF4J, Android, Heroku, PostgreSQL, RxJava/Android, Retrofit 2, Timber, Dagger 2, Butterknife, Junit, GIT, Maven, Gradle, Arch Linux	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Sean Breen	**Supervisor:** Dr Sean McSweeney
Project Title: DrumBooth, a Musical Audio Harmonic/Percussive Separation and Dynamic Mixing	
Research Question: Does musical audio drumbeat separation ease the process of track editing	
Project Abstract: DrumBooth is a software application for Windows which enables the user to isolate and separate the harmonic and percussive components from an audio file. It functions as an audio player, has a spectrogram that can be enabled and disabled during execution, and is designed to be used by musicians who want to enhance or suppress these audio qualities to hear certain instruments better in the mix, or to remove components entirely. It is built with C++ using the JUCE framework. It also makes use of the Eigen library for matrix multiplication and FFTReal for performing Fast Fourier Transforms on the audio data. The method of separation is adapted from the method described by Fitzgerald ["Harmonic/percussive separation using median filtering", DAFX10, 2010]. For drummers specifically, there is a section where the user can browse through and view each of the 40 Percussive Arts Society's drum rudiments with examples for how to apply them in a musical context.	
Technologies used: JUCE, C++, Audio processing	
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Student Name: James Walsh	**Supervisor:** Dr Aisling O' Driscoll
Project Title: Opponent Modelling: Machine Learning in No Limit Texas Holdem	
Research Question: Can opponent data aid in decision making and better understand player strategies	
Project Abstract: No Limit Texas Hold'em is a hugely interesting subject matter for artificial intelligence research. It is a game of imperfect information where multiple competing players must consider risk management, unreliable information and deception.This project aims to model opponents based on their actions in a given position based on their hand strength and potential. With this information a player would have a better understanding of an opponent's strategy and aid in decision making.	
Technologies used: telliJ, Java, Maven, MYSQL, Weka, Poker Effective Hand Strength Algorithm, Two Plus Two Poker Hand Evaluator	
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Student Name: Anthony Mellerick	**Supervisor:** Dr Sean McSweeney
Project Title: DroNE: Drone Responder of Network Emergencies	
Research Question: The potential in drone technology as a response to network emergencies	
Project Abstract: DroNE consists an ad-hoc network constructed using Raspberry Pi boards. This network is monitored by a collector node using nmap. Python scripts on each node request drone responders from the monitoring node when event conditions are met. The collector node logs these drone requests in a local database that is exposed to an android application. A user of the android application is alerted to node requests and status. Upon verification of a valid requested by the user a drone responder is then deployed to the nodes location	
Technologies used: Raspberry Pi, MySQL, Python, Android, Java, DroneKit, 3DR Solo Drone, Manjaro Linux	
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Student Name: David Hurley	**Supervisor:** Colin Manning
Project Title: Spoiler Filter for Social Media Feed	
Research Question:	
Project Abstract: Discussions on social media make it harder to avoid having your favorite TV shows spoiled. This website displays a user's Facebook, Reddit, and twitter feeds while removing posts can contain specific words or phrases.	
Technologies used: NodeJs, Express, Mysql, Github,Bluemix	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Jonathan Patterson	**Supervisor:** Méabh O'Connor
Project Title: MilkQuality Mobile App	
Research Question: The development of a business intelligence app that enables dairy farmers to view visual charts and graphs of the up-to-date milk recording data.	
Project Abstract: The recent developments in dairy farming such as the abolishing of milk quotas now mean there are huge opportunities for farmers to grow profitably. Most dairy farmers' main source of income comes from milk sales so maintaining quality of the milk is of critical importance. The aim of this project is to build a mobile app which will allow farmers to quickly view easy to understand, up-to-date visual representations of the latest milk recording from their dairy herd. This will enable farmers to make better business decisions from having an understandable analysis of their milk data to hand. A hybrid mobile app was built using the Ionic Framework (HTML, Javascript and CSS) and BackAnd Server Side Infrastructure. The app contains an inbuilt SQLite database that pulls data from the server for manipulation into charts for the user to view. The app will login authenticate via the BackAnd server. There are three main pages displaying different milk data.	
Technologies used: Ionic Framework, SQLite, REST,JSON,Chart.js	
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Student Name: David Monaghan	**Supervisor:** Méabh O'Connor
Project Title: Development of a service to host web sites	
Research Question: What is the best way to design a service that hosts web sites?	
Project Abstract: The primary goal of this project is to develop a service that will allow a customer to create a website, quickly and easily, without having to worry about the technical issues such as installing or configuring the servers required. The service is designed with scalability and security in mind. The project research focused on three specific areas - the industry consensus on the requirements for a web-based application, the best architecture paradigm for a project of this nature and the best virtualisation solution for this project. The sites will be hosted using a new virtualisation technology called LXC (LinuX containers) that will be distributed on a horizontally scaled network. The service will use a database driven website as a front-end for managing servers and their settings. The service is being designed with a service oriented architecture and with security as a focus.	
Technologies used: Go, LXC, MySQL, Ubuntu Server 14.04.4, Apache 2, PHP5, Wordpress	
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Student Name: Jakub Sabacinski	**Supervisor:** Dr Ignacio Castiñeiras
Project Title: Beauty Salon Software System	
Research Question: Model view controller-based application for a real-life business	
Project Abstract: Nowadays businesses –no matter whether big or small- must incorporate a computer system as a key component of their business model. This project describes the full life-cycle development of a computer system for operating a new Beauty Salon recently opened in Cork city centre. Its main functionality, which is based on preliminary conversations with the business owners, includes: High-quality client database (with a complete client history), appointment scheduler, simple and reliable stock management, employee file management, report based analysis, text message reminders and a client Android-based mobile application for making appointments. The project surveys on related applications, describes in detail the software development process (including detailed description of use cases implementations) and provides general conclusions about the applicability of the aforementioned development process to other businesses.	
Technologies used: Java, JavaFX, MySQL, PHP, Dynamic Reports, Clikatell SMS Gateway, Amazon RDS	
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Student Name: Daniel Junyszek	**Supervisor:** Dr Ignacio Castiñeiras
Project Title: Integration of BizTweet System with one or more social media platform	
Research Question: Interfacing a state-of-the-art social network API to a SaaS social decision software	
Project Abstract: BizTweet is a social decision software allowing corporations to automatically communicate with their customers via email and social media. Distributed on a Software as a Service cloud product basis, it provides fully operational communication -via the social network Twitter- for the three accounts it is currently serving: A demo account FlightStatus (being feed from an air traffic information provider) and two commercial airport accounts for Dubai Airport International and London City Airport. With a growing trend on its number of customers, extending customer communication to other social media becomes a must step for BizTweet. It is this requirement that this project fulfils with the integration of Facebook. The project starts with a survey on state-of-the-art social networks, so as to select the most appealing one. Once Facebook is selected, the project describes in detail the software development process to integrate it into BizTweet, including: Functional and non-functional requirements, detailed description of use cases implementation and general conclusions for further integration of other social networks.	
Technologies used: Java, JDBC, RestFB, GitHub, SVN, MySQL, PHP, CURL	
Class: BSc (Hons) Software Development – Year 4	

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Student Name: Tadas Semionovas	**Supervisor:** Dr Ignacio Castiñeiras
Project Title: Better Weather App	
Research Question: Developing a mobile app interacting with third-party state-of-the-art online weather and geolocation providers.	
Project Abstract: The purpose of this project is to create a good looking Android-based mobile application allowing users to find out current and forecast weather information by accessing to the API of online weather providers. The app also supports geospatial location of webcams -using Google Maps services- close to the searched city and view snippets to see the actual look of the current weather state.	
Technologies used: Java, Android Studio, WeahterLib API, OpenWeatherMap API, Volley, Weather Underground API, SQLite database.	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: Mai Clifford	**Supervisor:** Dr Ignacio Castiñeiras
Project Title: Locate My Child (LMC)	
Research Question: Developing a web + mobile phone application to support geolocation of a preconfigured mobile phone by using state-of-the-art geolocation technologies. The application also includes (limited) bidirectional communication between the preconfigured mobile phone and the one controlling it.	
Project Abstract: Locate My Child (LMC) is a mobile application and website which monitors and tracks your child's location in real time and keeps a record of your child's past locations for the previous week. The application is designed to be unobtrusive and easy to use, and can also be accessed through the website http://www.timai.cloud. It is common knowledge that children, even those as young as seven, have smart phones. These kids have grown up in a technological world, never far from an electronic device. Currently on Google's Play Store, the GPS tracking apps that are available are friends, family and suspicious spouse orientated, meaning there are no applications targeting the tracking of children by parents specifically. This application will fill that niche, where parents are in full control of the application on the child's device and can also use the application's website as an aid to keeping children safe. The application can be used for younger children solely as a tracker and for older children as a means of minimal communication with parents on an as needed basis only. Parents can monitor the child's whereabouts in real time and can access the last seven day's route history. A child can send an SOS, get directions home or get directions to the nearest safe place. The people who will benefit from this mobile application and accompanying website are any parent/guardian who has a child with a mobile phone. It is not necessary for the parent to have a mobile phone as they will have access to the website but the child must have the application installed on their mobile phone, and have GPS and internet turned on. The purpose of this project is to afford parents peace of mind and leave them comfortable in the knowledge that they know their children's whereabouts. It is intended solely as a parental aid, not a replacement for good parenting.	
Technologies used: Java, JavaScript, PHP, JQuery, HTML, GitHub, AngularJS, MySql, MVC, Materialize, Android studio.	
Class: BSc (Hons) Software Development & Computer Networking – Year 4	

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Student Name: John Vincent O' Dwyer	**Supervisor:** Gerard MacSweeney
Project Title: Draft Fantasy Football Website	
Research Question: Could fantasy premier league be more user interactive?	
Project Abstract: The popular online game, fantasy premier league, does not involve any interaction between users and their teams. It allows teams in the same league to have the same players. This project will aim to create a new fantasy football game where user interaction is more prominent by creating completely unique teams, where no two teams in the same league will have the same player, and allowing users to transfer players with other teams in the league. To achieve this, a draft will have to be run before a league starts where all teams in the league take turns selecting one player per turn until they have a full squad of players. Once the draft has finsished the league begins and managers are free to trade players with other managers or pick up unselected players (free agents) and compete against each other in a head-to-head league.	
Technologies used: PHP, MySQL, HTML5, CSS3, JavaScript, JQuery, Ajax, Github	
Class: BSc (Hons) Web Development – Year 4	

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Student Name: Jeremy Cronin	**Supervisor:** Gerard Mac Sweeney
Project Title: Online Platform for Student Work Experience	
Research Question: How can Students find possible work experience?	

Project Abstract: This project is being done in the hope of creating a platform for current students attending college or university to go and find possible work experience for themselves in their field of choice.

Students will be able to gain a better understanding of whether or not they will want to proceed with their current degree instead of having the options of no work experience for when they finish college or having the experience very late on during their degree.

The website uses a MySQL database to hold the information regarding jobs, applications and users. The interface was developed using a combination of PHP, HTML, and bootstrap CSS. Since these tools were being used to develop it, an Ubuntu 14.04 server was chosen as the hosting system. The server is hosted by Digital Ocean who provide a good framework for expansion, but at an added cost.

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Student Name: Ray Murphy	**Supervisor:** Noreen Gubbins
Project Title: Smart Device Security Management.	
Research Question: What threats do smart devices pose and what can be done to mitigate these threats?	
Project Abstract: The rising popularity of smart devices has led to increased cyber-criminal activities and a surget in the number of threats associated with these devices. Users are often unaware of threats posed or lack awareness of managing the security of devices. This project investigates the threats smart devices pose to users and the measures users can take to mitigate these threats.	
Technologies used: KingRoot, zAnti, Cloud VPN, Hoxx VPN Proxy. Hardware: Smart Devices.	
Class: BSc (Hons) IT Management – Year 4	

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Student Name: Eric Falvey	**Supervisor:** Noreen Gubbins
Project Title: Analysis of Intrusion Detection Systems	
Research Question: How well can an intrusion be detected on a system?	
Project Abstract: Intrusion detection systems are used by companies as a line of defensive security. Intrusion detection systems may not always detect intrusions.. This project surveys a range of techniques and methodologies which are used by current intrusion detection systems. An overview of existing intrusion detection systems is provided. This project aims to evaluate intrusion detection systems deployed on a vulnerable system. Each intrusion detection system is evaluated according to set criteria. The strengths and weaknesses in detecting an exploitation of the system within a virtual environment are assessed.	
Technologies used: Metasploit framework, OSSEC, Snort	
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Student Name: Stephen Murray	**Supervisor:** Dr Sean McSweeney
Project Title: Greenhouse Management System	
Research Question: Can we use IOT technologies to improve greenhouse control systems?	
Project Abstract: The motivation behind the Greenhouse Management System was to investigate how smart technologies can be integrated into products used in everyday life that do not currently exist that fulfil. The problem this project aims to solve is to investigate the feasibility and usefulness of integrating smart technology into greenhouses aimed at the amateur gardener market. The method for solving this question was to build a prototype on a breadboard using weather related sensors and hardware components (listed below) to model this scenario. The retrieved data was logged for display of historical information and a mobile app for monitoring the current conditions inside the greenhouse was developed and tested. Functionality to allow for manual control of the hardware components was also integrated into this app. MongoDB was used as a database to allow for flexibility in added sensors to the system without changing database structure. C/C++ was used as the control/database logic for efficiency purposes. The prototype developed has shown the integration of smart technology into greenhouses is both practical and useful to the owners of the product.	
Technologies used: Android, Java, C, C++, MongoDB, Github, Gedit, Nano, Raspberry Pi, Sensors (air humidity, hygrometer, temperature, ambient light, water level, barometer), 2 server grade fans, peristaltic pump.	
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Student Name: Fooz AlSubaie	**Supervisor:** Dr Sean McSweeney
Project Title: Virtual Helpdesk	
Research Question: To optimise the usage of an IT infrastructure within an organisation by implementing a virtual helpdesk that is based on the ITIL helpdesk function.	
Project Abstract: The main objective of this project is to optimise the usage of the IT services in Cork Instituteof Technology. The project is to create an application to help visitors, new staff and students to optimise their use of the provided IT services within CIT by observing the applications portfolio in CIT and enhance their uses by troubleshooting common mistakes and misuse by creating a user guide as a service desk which is one of the ITIL functions. Having a virtual help desk is beneficial where it cuts down operational costs, and improves usage of available resources. Also, it can improve productivity where users will be able to fix an incident at a primary support level rather than calling into a desk every time a user faces an incident. Tasks include handling incidents and requests; features include single point of contact, easier for users. Primary purposes of the virtual service desk include: ● Incident control: where it provides a guide to use the services with personalised experience. ● Configuration management ● Guidelines and tutorials on using and troubleshooting the services. Core activities: requirements gathering, design, development, testing, debugging, deployment and maintenance. Methodologies and frameworks: RAD (rapid application Development) This development process is chosen due to the flexibility it provides. RAD is especially well suited where the development is driven by user interface requirements. Supporting disciplines: Project Management.	
Technologies used: Xcode, Swift programming language, Adobe Illustrator.	
Class: BSc (Hons) IT Management – Year 4	