SETU
Ollscoil Teicneolaíochta an Oirdheiscirt
South East Technological University

COMPUTING PROJECTS SHOWCASE 2023

Welcome

I am delighted to present this, the Final Year Project handbook, of our first graduating cohort of South East Technological University.

As Waterford Institute of Technology we have developed an international reputation for excellence in computing research and development. This has allowed our students to get first-hand experience of the latest skills and knowledge of emerging computing disciplines. Now as we embark on an exciting future as South East Technological University we will build on efforts to ensure that every student is empowered to achieve their full potential.

Our programmes are highly practical, focusing on enabling the students to develop meaningful and deep learning experiences that are relevant and for today's working environment. Students are offered industrial placements or the opportunity to study abroad as an integral part of each programme.

The Final Year Project represents, for most of our students, the culmination of 4 years of study in their chosen programme. It capstones their learning and in many cases it allows them to showcase skills that they have developed outside of the lecture room and computing lab. The class of 2023 has also faced the challenge of the COVID-19 pandemic during their years of study. This has provided the students with important experiences in adaptability and resourcefulness to ensure they completed their studies to the high standard expected of SETU graduates. Seeing our graduates come through this period and to deliver high quality projects brings immense pride to our staff.

The 2023 Computing Projects Brochure provides the students with an opportunity to showcase their project. We hope that our industry partners use this brochure as an opportunity to discover excellent student projects, possibly with a view to exploring recruitment opportunities.

The showcase is split into three sections: undergraduate BSc programmes, online HDip programme, and MSc programmes.

Dr Alan Davy,
Head of Department of Computing & Mathematics,
South East Technological University (SETU)

Welcome from Lucy White, the FYP Co-ordinator

It is with great pleasure and deepest pride that we in the Computing and Maths department at SETU Waterford, present to you, our colleagues, students and industry partners, the outstanding work of our final year computing students.

The final year project allows students to demonstrate what they have learned over the course of their studies, integrate their knowledge in a capstone project, and produce a significant piece of work to ultimately showcase at the Computing Project Expo.

As the students have studied across a range of different programmes that specialise in their own distinct disciplines and subject areas they have cumulatively produced an extensive catalogue of innovative and creative projects that range in type, discipline and complexity. This brochure/online showcase will help you to easily navigate the final year projects by course or subject area. You're in for a treat!

A final word to our students …

A heartfelt congratulations to you all on completing your final year project. I know the road was sometimes long but your consistent work, drive, determination and unwavering commitment to the process has brought you to this point.

The Computing Project Expo is your chance to showcase your project. We are delighted to celebrate with you and we are looking forward to seeing your hard work come to fruition.

Enjoy and have fun!

Lucy

Welcome from Colm Dunphy, the HDip Project Co-ordinator

The Higher Diploma in Computer Science (online) was the first fully online programme from WIT, now SETU. Students graduate as full-stack oriented developers. The programme was designed to be delivered online, with an emphasis on student experience, engagement, and building a learner community promoting peer learning. The programme has pioneered the innovative Agile Semester approach to delivery. This showcase of projects presented in April 2023 highlights the diverse range of graduate capabilities from this programme. Students on the programme complete their studies while on a six month work placement. During this time they complete a capstone project. Students and graduates continue to be highly sought after. If your company is interested in mentoring a student on work placement please contact joan.mangan@setu.ie

This year projects include native android app development, web apps, and a combination of both, in the one project. We also saw some leverage hybrid and progressive web approaches to building both web and mobile apps. There were projects focusing on DevOps, SysOps, creating cloud CI/CD pipelines, testing gradles, and IOT and physical computing projects involving hardware sensors with web and mobile interfaces. We had workplace projects leveraging the Microsoft Power platform, Amazon's AWS, MS-Azure, and Red Hat OpenShift. A number of workplace projects are private (the details of which are withheld under NDAs). A number of projects contributed to the open source community including tutors.dev, and Strimzi. We also had dashboard and data analytics projects. Student projects use multiple APIs, and are deployed in different environments (AWS, AZURE, OpenShift).

Within the HDip section of this booklet, student thumbnails link to project videos, student names link to the project page. The project pages summarise the project and includes links to github, Youtube and web pages for the project, deployment details, etc. QR codes for each project are also provided.

In summary, we are often asked what our course is about and what can you do after completing it? Well, this showcase answers both questions through our students' hard work. Enjoy the diversity, innovation and creation. From the entire team, we would like to thank the students for their work over the last few years, and we wish you every success which you will no doubt have in the future.

Regards,
Colm Dunphy

The Department of Computing & Mathematics in the School of Science & Computing is working with our Industry partners to shape our third level curriculum and to ensure that our courses are of the highest standard. Our graduates are high calibre with strong innovative and creative skills that allows them to fill vacancies across a wide variety of interesting sectors, in flexible and well-paid computing roles. This has led to a high percentage of our computing graduates gaining employment within a few months of completing their course and often quickly getting promoted in their new careers.

ICT Industry Board

In December last year, the School of Science and Computing at SETU reactivated its ICT Industry board with members from 15 organisations spread throughout the South East of Ireland. This was in line with the National Strategy for Higher Education 2030. The department of Computing & Mathematics are committed to engagement with Business and Industry in our region and beyond. The ICT Industry Board will address the:

- Creation of a mutually beneficial ICT partnership between SETU and our stakeholders.
- Provide guidance on the creation of new ICT programmes at SETU.
- Knowledge transfer and the creation of joint research projects that support regional needs.
- Development and provision of education and training for employees to address the need for lifelong learning and upskilling.
- Development of new high-quality internships and work placements for students while evaluating current internships and placements.
- Provision of employer feedback on graduate employability and competency skills.
- Provision of employer guidance on current curriculum content and structure and course delivery in relation to theory and practice.
- Development of initiatives which will cater for the increased capacity in higher education going forward and address funding and operational challenges associated with these initiatives.
- Need to support University initiatives for promotion and marketing of ICT in the region.
- Management of the School of Science and Computing relationships and activities with industry in an informative and constructive manner.
- Development of Memorandums of Understanding with suitable Industry Partners.

Work Placement Programme

The **Work Placement Programme** for Computing students at SETU is an integral, accredited set of modules for all of our third year undergraduate students. Work Placement gives students the opportunity to apply the theory they have acquired on their degree programme to real-world problems and tasks, in an industry setting. It also enables the Department of Computing & Mathematics to be informed of the ever-changing needs of our industry partners and to build on our relationships with companies in the region and nationally.
Further information is available at https://www.wit.ie/schools/science/industry-engagement or you can contact our Work Placement Manager, Tracy Murphy, at tracy.murphy@setu.ie.

Industry–led Final Year Projects

Do you have an idea for a final year project which is based on your experience in industry? Increasingly, students engage in projects that have a strong industry focus. Please note however that students will not be able to work on projects which have industry deadlines and an expectation of concrete deliverables. You can submit your ideas by contacting Tracy Murphy, at tracy.murphy@setu.ie.

Collaborative Agreements

In an effort to formalise links between the Department of Computing & Mathematics and our industry partners we are seeking to sign **Collaborative Agreements** with these partners. These agreements are not binding in any way but rather document areas where there is ongoing collaboration and identifies areas where there is potential for further activity. The document covers

- Sponsorship
- Placements
- Graduate recruitment
- Research opportunities
- Points of contact

Specifying the points of contact details for the industry partner and for SETU under a range of headings will ensure that there is an appropriate flow of information between the parties.

Second-Level School Visits

The department has modified the way we conduct school visits by integrating employees of Red Hat and Sun Life into our visits to Secondary schools. We have also brought students who are already doing courses in our department to these schools, some of which are often past pupils. This new innovative approach has revolutionised our school visits as it allows those who are already students to give an insight to our courses and outline a typical day, this is complemented by employees

from industry outlining their careers so far and the vast array of opportunities that are available in the world of technology. School feedback has been excellent from this initiative.

It is hoped that more companies will come onboard to support our visits next year to add different perspectives from other ICT sectors. Please contact TJ Mc Donald at tj.mcdonald@setu.ie if your organisation is willing to support this initiative.

Women in Technology 2023

SETU were delighted to host the 3rd 'Women in Technology' event sponsored by Red Hat on our campus at the SETU Arena last March. This event was a huge success and attracted over 1,200 female students from Cork, Tipperary, Kilkenny, Wexford and Waterford. The event had female keynote speakers from companies like Red Hat, Sun Life, Intel, Cartoon Saloon, IDA and the Walton Institute. Over 20 companies from the region took stands on the day and gave insightful information to the visiting TY, 5th & 6th year students and their teachers on ICT careers and opportunities.

The event showcased the very best of Women in Technology, provided inspiration and encouragement to all those who attended, some of whom may have been curious about a job in technology and further inspired those that already saw this as a pathway to a great career. Attendees met with and talked to women who have interesting and varied careers in technology, engineering, ICT, physics and software development. Women who are changing the face of technology and society. We are looking forward to 2024 already, please contact TJ Mc Donald tj.mcdonald@setu.ie if your organisation would like to be a part of it next year.

Computing and Engineering Building

SETU has secured government funding for a new **Engineering, Computing & General Teaching Building** which will open in Q3/Q4 2026. This 12,800 m^2 building will revolutionise the teaching of computing in the region and will be a catalyst for increased cooperation with industry. We are very grateful to our industry partners for their help in securing the funding and we look forward to working together to ensure that the building realises its full potential.

Computers for Schools

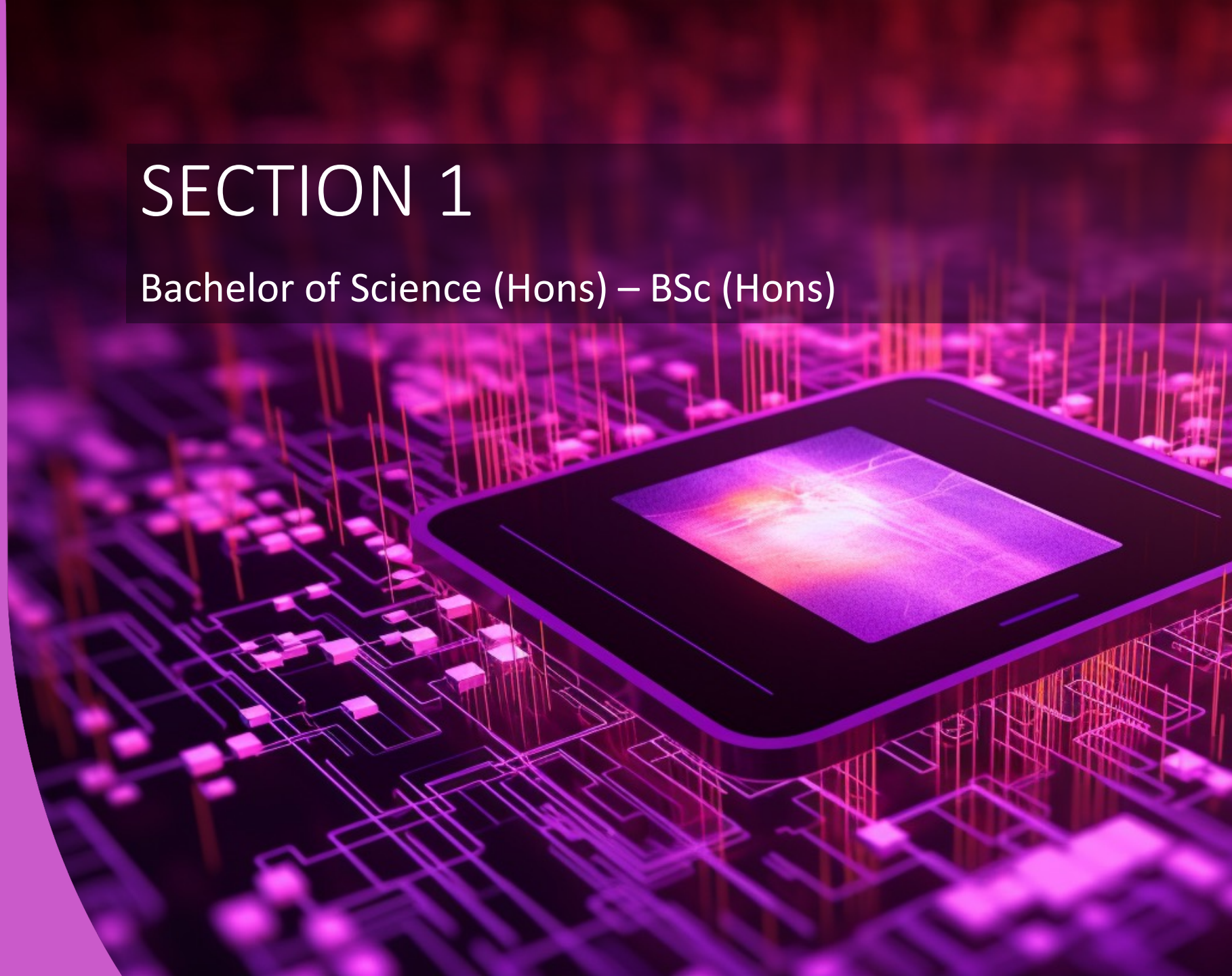
The **Computers for Schools initiative** is an attempt by WIT and the local IT industry to address the hardware needs of schools in the Waterford City region by recycling computers into schools. In 2019, Sun Life Financial recycled 40 of their 3 year-old computers through this scheme into two local schools. The reactivation of this programme seeks to create a sustainable pipeline of computers for schools from industry. Further information is available by contact TJ Mc Donald tj.mcdonald@setu.ie or at https://www.wit.ie/computers4schools

Projects by Progamme

Projects by Type / Subject Area

SECTION 1

Bachelor of Science (Hons) – BSc (Hons)

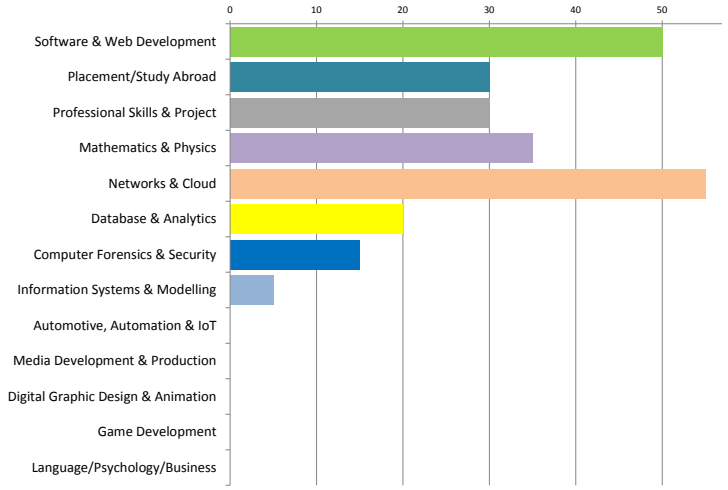


BSc (Hons) in Applied Computing

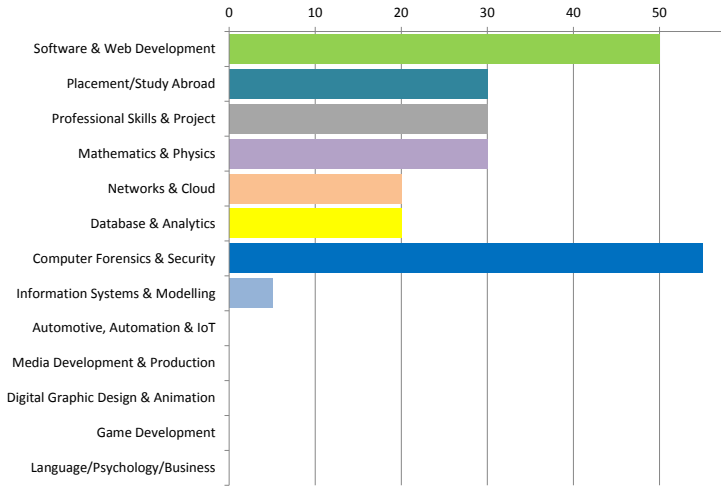
The aim of the BSc (Honours) in Applied Computing is

to provide a broad but focused, curriculum of computing and software development concepts. This is complemented by the study of particular problem domain areas (e.g. Games Development, Cloud Computing). The intention is for the student to not only learn the technical skills, but also to form an appreciation for the context in which the technologies are used and the processes involved in successful development.
At the start of their study, the student will be introduced to a broad range of subject material, with an emphasis on applying the scientific method. Later, the student will be exposed to challenging and rigorous study of system development (from analysis to design to implementation and verification) and apply these principles to small to medium sized systems. The student will be given a foundation in an application area of their choosing (from Media Development, Computer Forensics & Security, Cloud Infrastructures, Automotive & Automation Systems, Game Development, and the Internet of Things) and gain strong proficiency in developing systems in this area.
It is important that the student be conversant with current trends and paradigms when they enter the job market. However, it is equally important that they will have transferable skills that will facilitate their career progression (e.g. project management, communication skills). To this end, throughout their study, the student will be introduced to these topics so that the practice of these skills will occur in a seamless and integrated way throughout the program.
A graduate of the BSc (Honours) in Applied Computing will be an enthusiastic and confident practitioner, comfortable with their ability to learn, and adapt to the ever-changing world of computing. They will be ready to embark on a challenging and rewarding career either in research or in the computing industry.

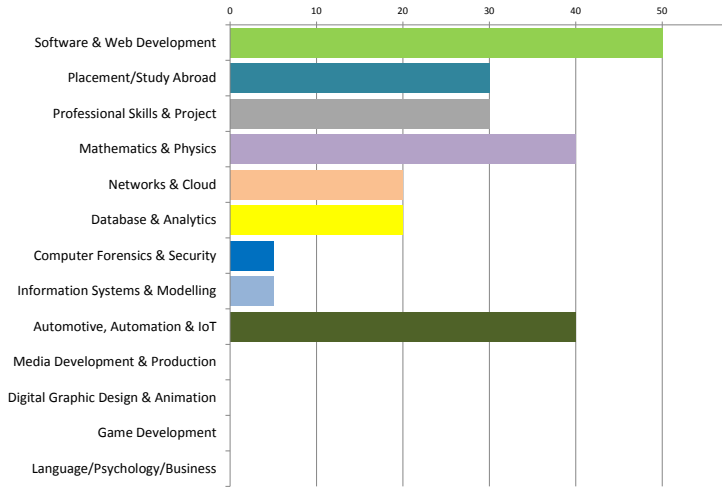
The breakdown of course credits across the four years on each specialism is illustrated by the following charts.



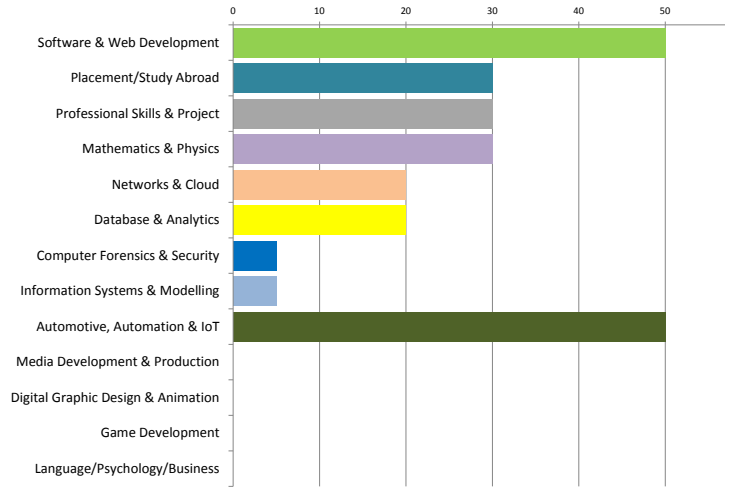
Networks & Cloud



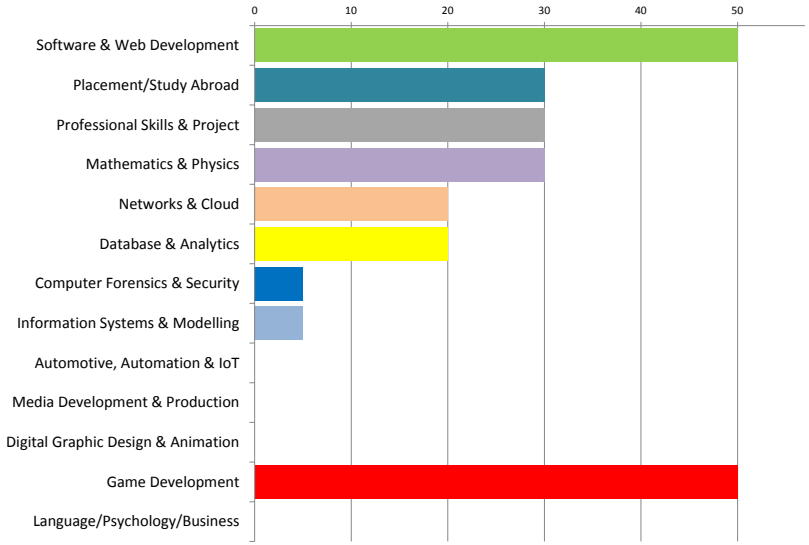
Computer Forensics & Security



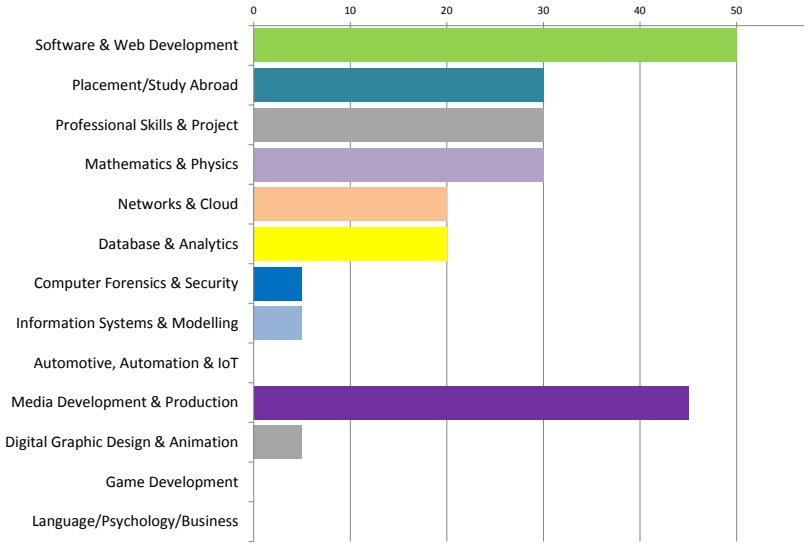
Automotive & Automation Systems



Internet of Things

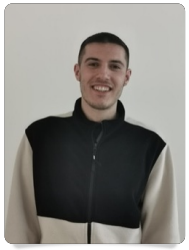


Game Development

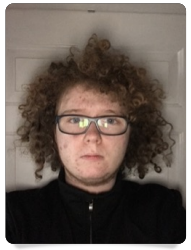


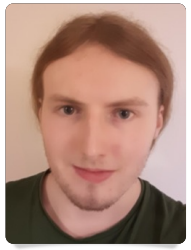
Media Development

Projects


Abaz Bajrami


Mark Bates

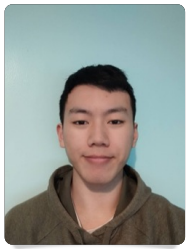

Tommy Dalton


Jack Fitzpatrick


Robert Jacob


Ryan Jenkins

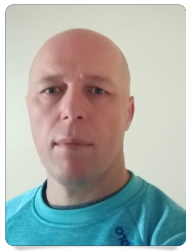

Bryan Keane


Tony JinHui Liu

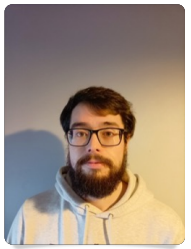

Anthony Lonergan

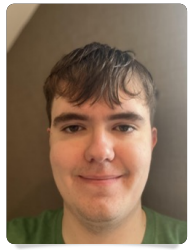

Caolan Maher


Denis Moskalenko


Milan Ples

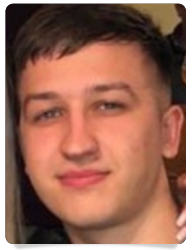

Jakub Poczatek

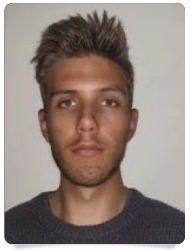

Jason Power


Aaron Russell


Patryk Stefanski

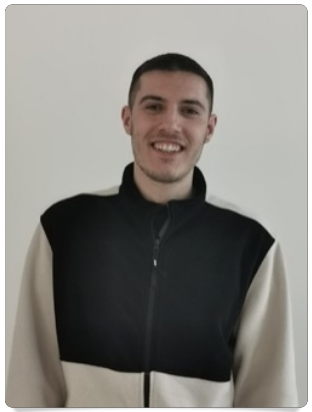

Allen Terescenco


Ernestas Trakys


Dominik Wawak

Cark Park Monitoring Drone

by Abaz Bajrami



The car park monitoring drone is used to monitor car parks in realtime. Users can use the app "Prime Parking" to find out how many available parking spaces there are in the destination they are about to commute to. This helps solve the problem of everyday commuters travelling to a location, only to find out there are no parking spaces available, which may lead to them trying to find parking elsewhere. The "Prime Parking" drone and app can also be used by businesses/institutes to monitor their car park for safety and security reasons. Inspiration: A large number of students commute to college using cars. When they commute to college, students find it difficult to find parking spaces during rush hours, for example in the morning between 8:30am - 9:30am. When students arrive at college, they are not guaranteed a parking space because of high congestion in college car parks, which may even force them to look for parking elsewhere. Some students may even miss part of their lecture time due to the difficulty of finding a parking spot. The app "Prime Parking" solves this issue by showing the students the amount of available parking spaces before they even leave their homes.

Technologies:

VS Code, Python, Amazon Web Services[S3, Lambda, Rekognition], DJI Drone

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Android and Arduino Based Plant Monitoring System

TL251 – 26

by Mark Bates

Inspired by current and future technologies and practices that aim to encourage a greener way of living, this project was created with the idea of adopting the growing of household plants in built up urban areas where the presence of natural greenery is limited. This is achieved with the use of Internet of Things (IoT) technologies and an intuitive android based mobile app in the hope that this can be smoothly integrated into everyday life. The objective of this project is to make the process of caring for houseplants and home grown produce carefree while also keeping the person using the device involved in the process. This is achieved with a mix of hardware and software technologies. Using an Arduino maker board attached to a number of relevant and useful sensors, the device gathers important data about the state of the plants environment such as soil moisture, temperature and humidity. This is stored on a database where it is then sent and displayed to the user via a mobile application. This then prompts the user to intervene if necessary for the plants overall health.

Technologies:

Kotlin, C++, Firebase, WiFi

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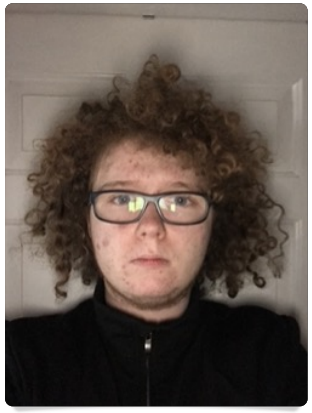
Isometric Low-Poly Rogue-Like Video Game

TL251 – 27

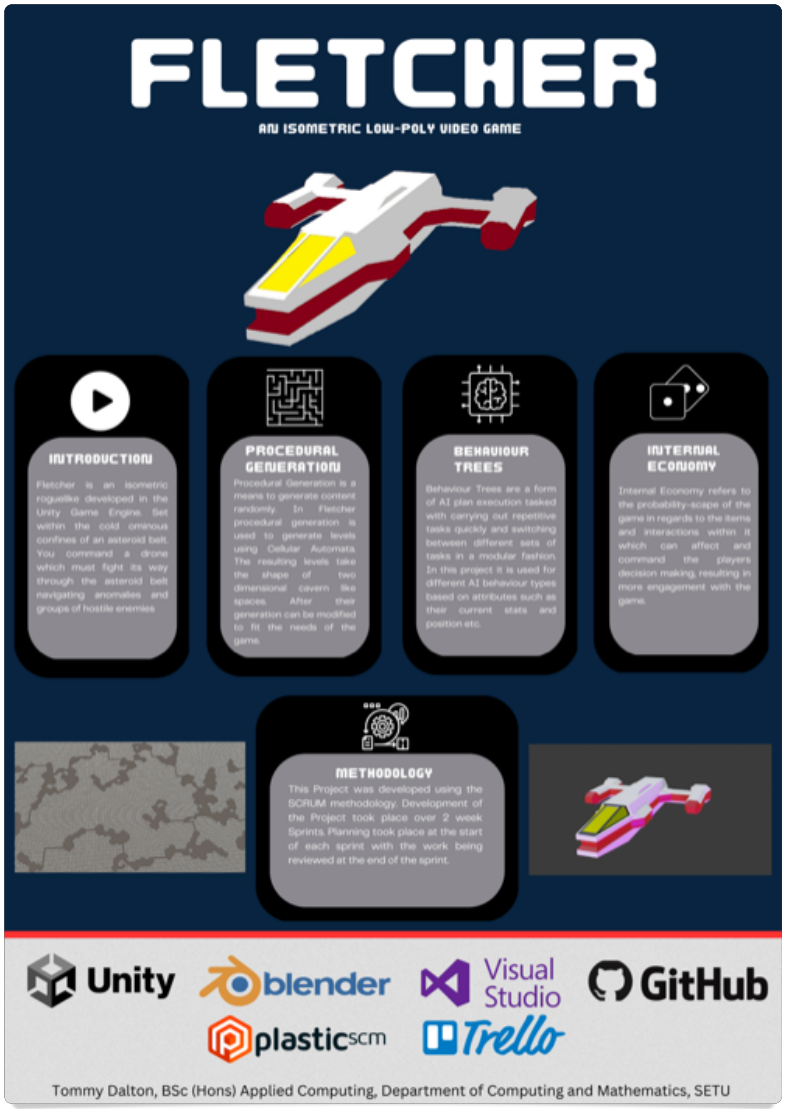
by Tommy Dalton



The main aim of this project is to create a Rogue-Like Isometric video game. The main goal of this video game will be to beat a series of levels with one life, death will result in being sent back to the start in order to play through the game again. The following are the complex features that will be present in the project: Procedural Generation: these methods are often employed in video games for content generation and will be developed in this project to randomly generate the environments for a different experience each time it is played. Smart AI systems: will be developed to ensure engaging AI that is able to make smart decisions and replan once circumstances change to avoid failure. Internal Economy: Balancing the games internal economy will be crucial in order to balance the games overall difficulty.

Technologies:

C#, Unity, Blender, PlasticSCM, Github



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The Use of Quadcopters in Conjunction with Machine Learning Technology to Provide Autonomous Aid in Search and Rescue

TL251 – 28

by Jack Fitzpatrick

In the past decade high quality quadcopters have drastically come down in price, portable cameras have become significantly better and training/using machine learning models to process live data on consumer level hardware in realtime is now very much possible. Despite the potential these technologies have in conjunction with each other to assist in search and rescue operations, it is rare to see them used. Search and rescue is often voluntary and can be stressful. Despite best effort it is unfortunately not always successful either. This project was created to explore and test the potential use of these technologies to autonomously assist with search and rescue missions. This is achieved by using Python scripts to automatically generate path plans and send commands to one or many Tello Drones to scout a set area. While this is happening data and video footage is being received from each drone. Video footage is fed into a trained Computer Vision algorithm and the output from this is used to determine further action such as adjusting quadcopter flight paths, notifying a search and rescue team something has been spotted, or summoning all quadcopters to a site for further analysis.

Technologies:

Tello Drones, Python, OpenCV, Tensorflow, Microbit, Vision Systems

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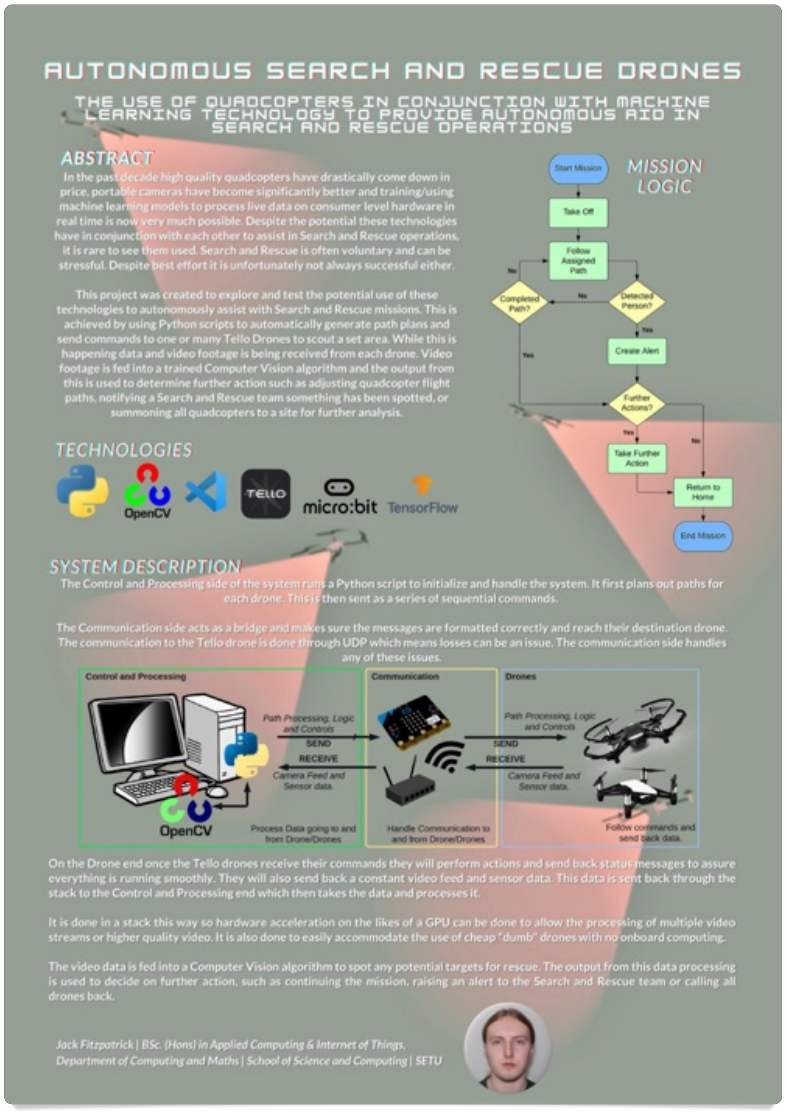

Software Defined Vehicle, Open Vehicle API Research and Prototyping

by Robert Jacob

Efforts are being made within the automotive industry to abstract the control functions of vehicles from the interfaces to those functions to facilitate the development of reusable interfaces. This trend in the industry has led to researching and developing generic vehicle APIs to interface with systems in the modern car such as climate control and infotainment. These generic vehicle APIs can then be used universally among vehicle models, standardizing the access to vehicle functions, and enabling new user applications. The possibilities with this technology include the remote control of vehicle functions to mobile applications, enhancing the experience of the end user. This project researches the current approaches to the generic vehicle API within the automotive industry and develops a vehicle API prototype based on the popular COVESA Vehicle Signal Specification (VSS) standard, running on the Vector CANoe platform. The system can be used as a test bench for integrating VSS with existing vehicle network architectures.

Technologies:

Vector CANoe, CAPL, Python, MQTT, VSS, VISS

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Lift It

TL251 – 30

by Ryan Jenkins

Lift It is a VR fitness game designed to teach people how to perform exercises correctly and safely. This game/application is a perfect way to make exercising more enjoyable. The idea for this was inspired during covid times. When gyms are closed people had no other option then to do home workouts which after a while became tedious and un-interesting. Lift It is the perfect alternative. Lift It demonstrates to it's players how to correctly perform exercises in a safe environment while also testing their ability. Once the player has finished their workout they will receive a score for what they have done and this score will be saved and they can access it when they play again. This will be a great motivator for the player and will encourage them to play again and to beat their score. Lift It incorporates many VR mechanics to allow this game to work proficiently. These mechanics are as follows: - Movement - Sight - Physics - Interaction. Lift It was designed in order to help and teach people and to put a fun twist into exercising.

Technologies:

Unity, C#, VR, Teaching/Learning, Databases, Animation, Networking

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Heimdall: A Custom Kubernetes Extension Which Enables Atomic Resource Ownership

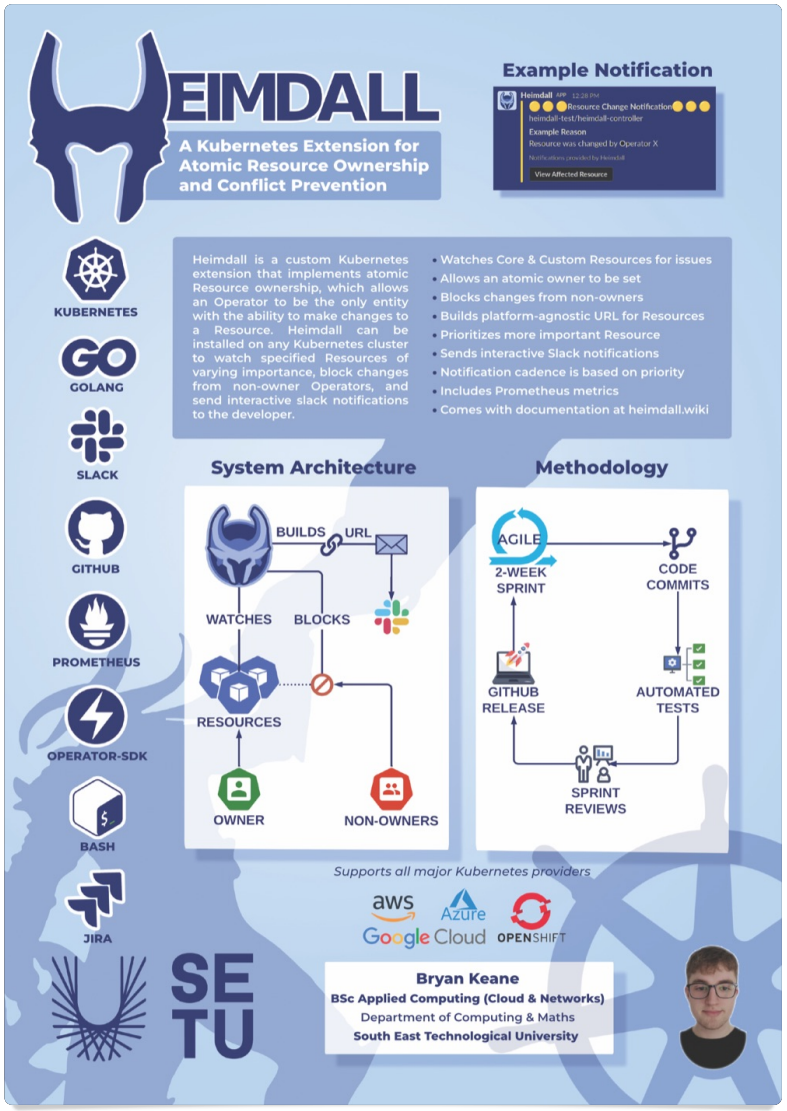
TL251 – 31

by Bryan Keane

My final year project, Heimdall, is a custom Kubernetes extension designed to address the issue of conflicting changes to Resources by Operators. By default, Kubernetes does not allow atomic Resource ownership and there is no existing solution to enable this functionality. Heimdall allows Resources to be configured with an atomic owner. When Heimdall is set to monitor a Resource, any incoming changes from its non-owner will be detected and blocked. This is done by reconfiguring the Role permissions of the Operator or Controller, preventing them from making further changes to the Resource. Heimdall also aims to make the process of fixing the problem easier. It sends an interactive notification via Slack to the team, providing a link to the problem Resource and Operator. The Controller comes with a comprehensive Wiki, including a guide on its use, Prometheus metrics, and Grafana support for a dashboard overview of Heimdall's metrics and performance.

Technologies:

Go, Kubernetes, YAML, Prometheus, Grafana, Jekyll, LaTeX, Git, Docker



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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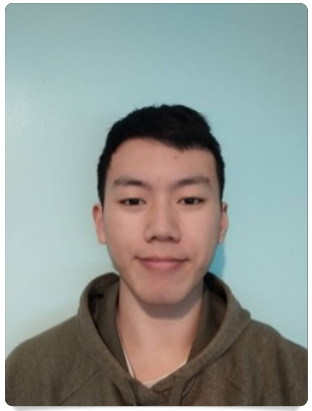
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Recognition Shopping App

TL251 – 32

by Tony JinHui Liu



This project aims to develop a mobile app that enhances the shopping experience using technologies such as Image Recognition with TensorFlow, Android Studio, Kotlin, and Firebase. The app will also employ the MVVM architecture to deliver an efficient and user-friendly interface that offers a range of functionalities. The app's features will include user registration and login, security code scanning, product scanning, cart page, profile page, payment page, and order history page. Users can create an account and log in to their account, and the app will store their information. To access the main store page, the app will need users to scan a security code unique to the store. Once on the main store page, users can scan products and view product information and add them to their cart. The cart page will display a list of the items the user scanned and added to their cart. Then allow for payment from the app. By using the latest technologies, this project aims to provide a solution that prioritizes convenience, speed, and simplicity for users.

Technologies:

Android studio, Kotlin, Firebase, TensorFlow image recognition

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Investigating the Aftermath of a Ransomware Attack

TL251 – 33

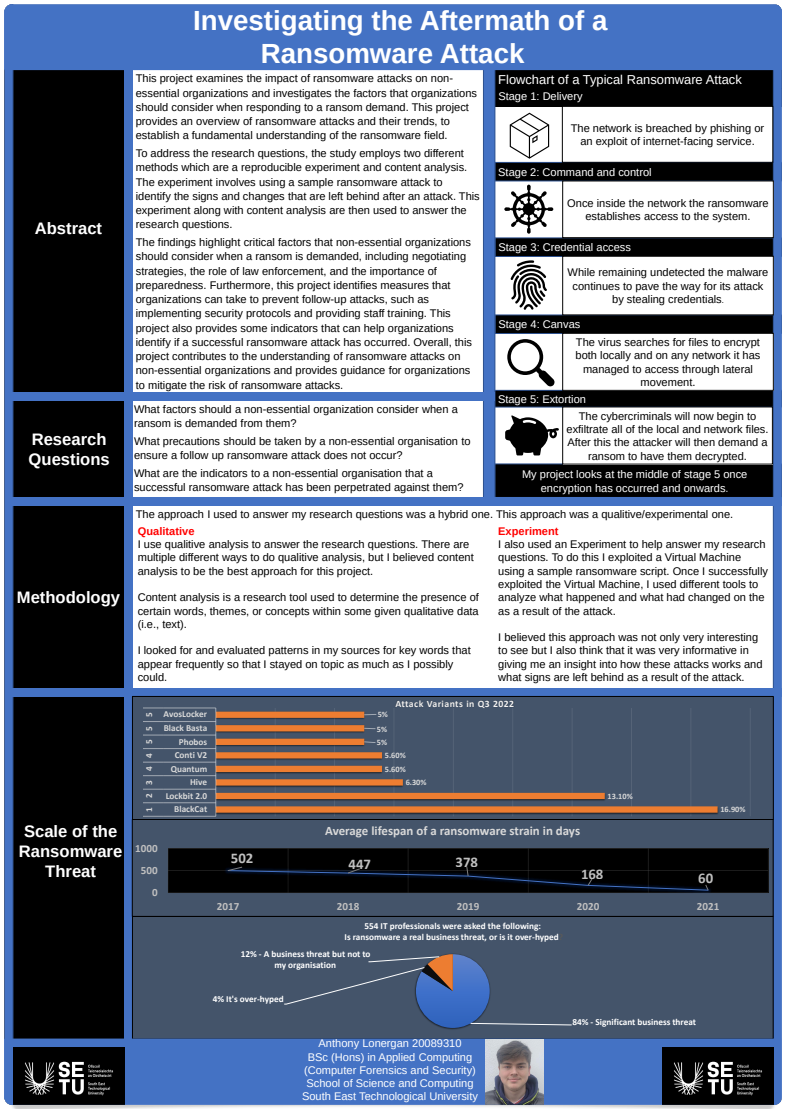
by Anthony Lonergan

This paper examines the impact of ransomware attacks on non-essential organizations. The paper provides an overview of ransomware attacks and their trends, to establish a fundamental understanding of the ransomware field. To address the research questions, the study employs two different methods which are a reproducible experiment and content analysis. The experiment involves replicating an attack using sample ransomware. This experiment along with content analysis are then used to answer my research questions. The findings highlight critical factors that non-essential organizations should consider when a ransom is demanded, including negotiating strategies and the role of law enforcement. Furthermore, the paper identifies measures that organizations can take to prevent follow-up attacks, such as implementing security protocols and providing staff training. The paper also identifies what indicators can help organizations identify if a successful ransomware attack has occurred. Overall, this paper contributes to the understanding of ransomware attacks on non-essential organizations and provides guidance for organizations to mitigate the risk of ransomware attacks.

Technologies:

VMware Workstation Pro, Excel, Word, LaTeX

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



Procedurally Generated 2D Unity Game with Advanced Enemy AI and Dynamic Difficulty Adjustment

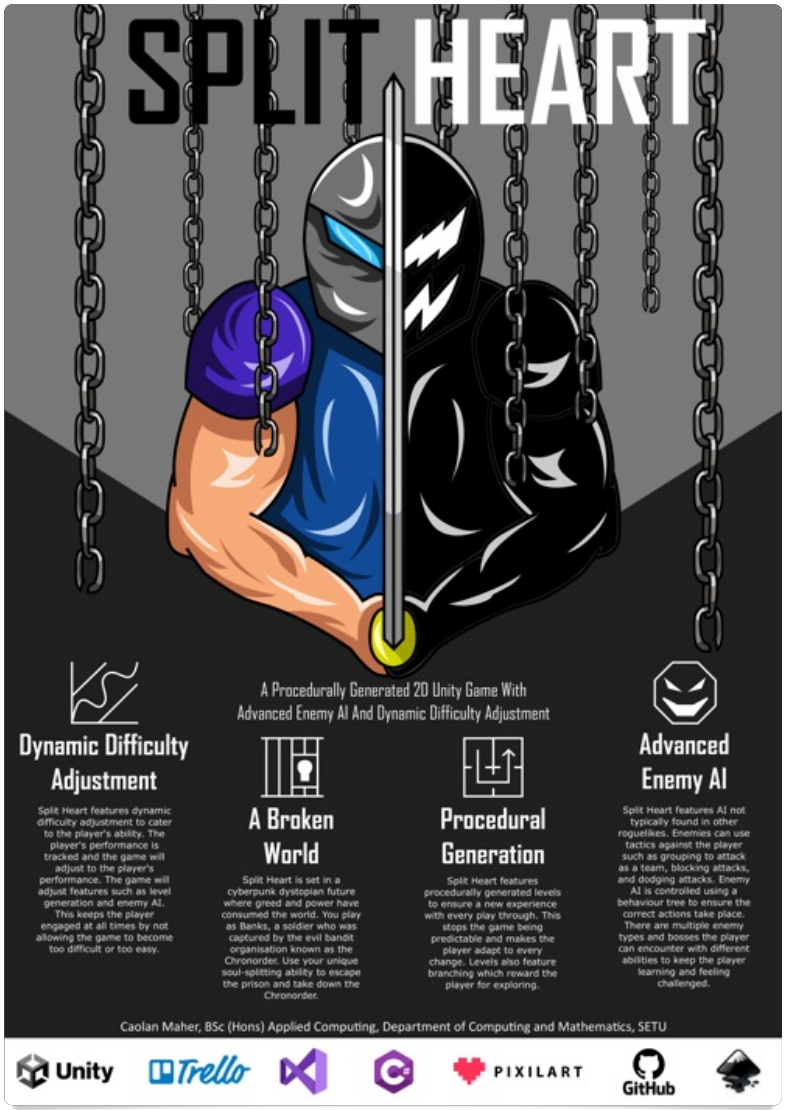
TL250 – 34

by Caolan Maher

Split Heart is a 2D game where if the player dies, they are sent back to the very start with new randomised levels. The game is set in a cyberpunk dystopian future where greed and power have consumed the leaders of the world. Bandits have taken over the once powerful city of Xadena. You play as Banks, a Xadenian soldier who was captured and kept as a prisoner. Escape your prison and fight your way through an army of bandits and bosses using your unique soul-splitting mechanic to get the upper hand on your enemies and free Xadena of this tyranny. Use an array of weapons such as a katana, dual swords, and a hand gun. Split Heart contains many complex features such as procedurally generated levels so every play through is different, advanced enemy AI that will keep the player on their toes with grouping and damage blocking mechanics, and dynamic difficulty adjustment where the game will cater the difficulty of the game to how well the player is doing. Split Heart also has an economy where coins dropped from enemies can be used to buy permanent and temporary upgrades.

Technologies:

Unity, C#, Git, GitHub, Trello, PixelArt



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Giants Conquest

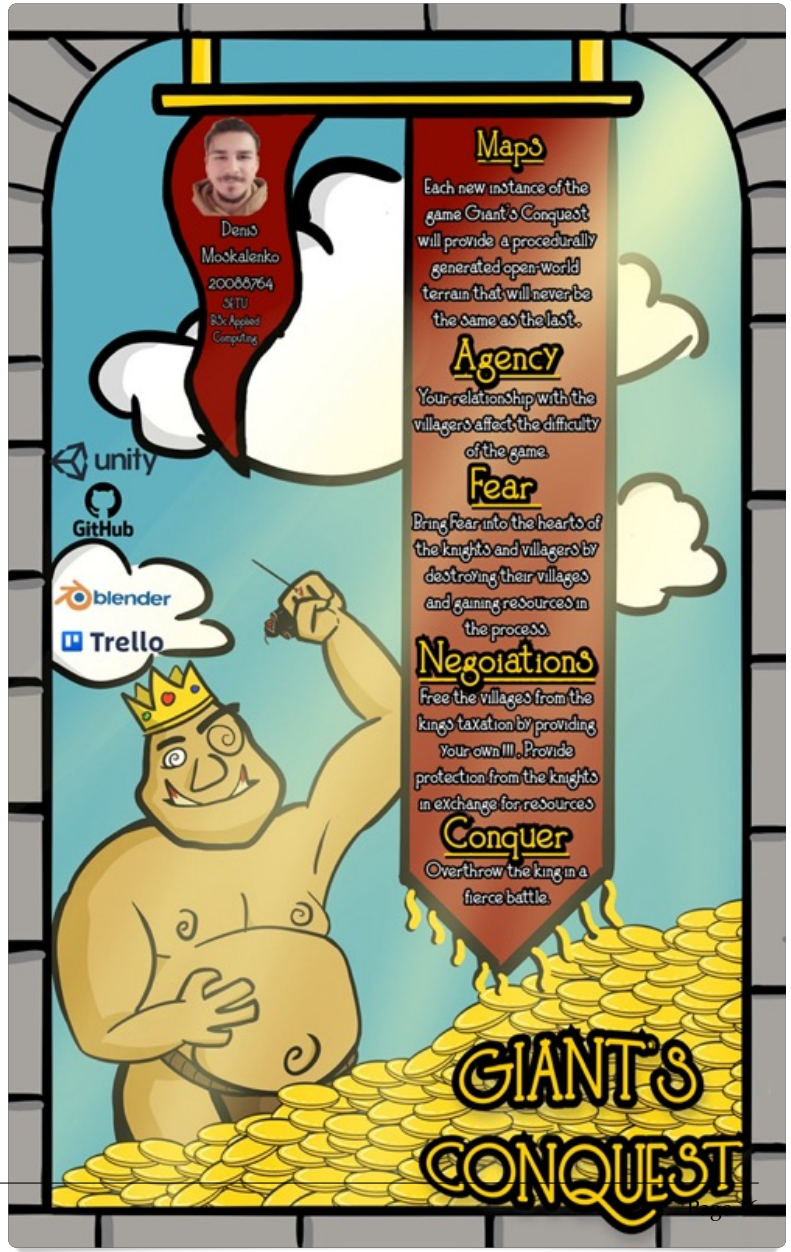
TL250 – 35

by Denis Moskalenko

Procedurally generated open world game where you play as a giant trying to overthrow the king. You do this by either destroying villages along with villagers or negotiating with villages for resources. Destroying villages will impact resource production of other villages. The kings knights will attempt to retake the villages to hinder your progress. Your actions will impact two dynamics, The fear index and The negotiation index. Both of these indexes control how easy it is to get resources, Fear index will allow for easier negotiation but worse resource production. Negotiation index is directly linked to the fear index, the less fear the harder it is to negotiate due to the villages being more protected by the knights. Once you have collected enough resources you face off with the kings army along with an army of your own depending on how many villages are under your rule.

Technologies:

Unity, Blender, GitHub, Trello



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Automation Pipeline

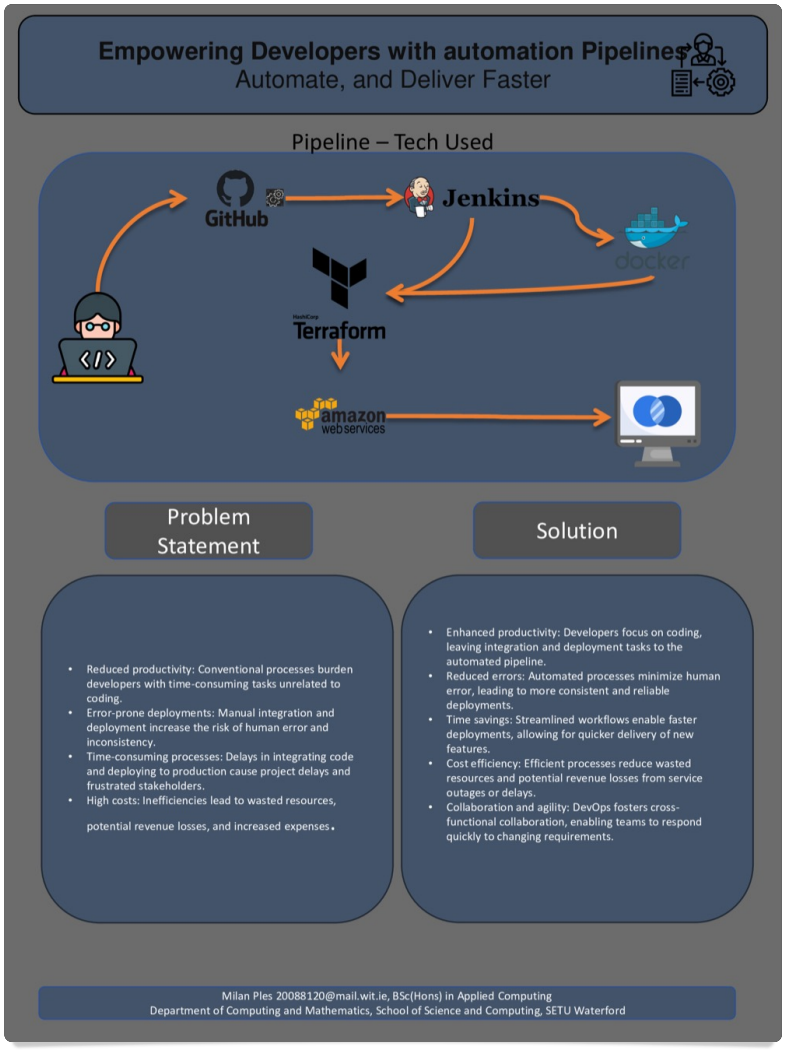
TL250 – 36

by Milan Ples

The objective of this project is to streamline the software development process by implementing automation pipelines using tools like Jenkins, Terraform, Ansible, Docker, and AWS. By doing so, developers will have a structured approach to building, testing, and deploying code changes, reducing the time and effort required. A central repository for code will also be established, improving collaboration and ensuring consistency among team members. Automation pipelines will facilitate the automation of tasks such as provisioning, testing, and deployment, reducing the likelihood of errors, improving efficiency, and enhancing the quality of the codebase. Ultimately, this project aims to simplify and streamline the software development process, freeing up developers to focus on producing high-quality code.

Technologies:

Terraform, Ansible, Docker, AWS, Jenkins



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Unity3D Based Low Poly Isometric Empire Building Game with Advanced AI, Procedural Generation and Population Management

TL250 – 37

by Jakub Poczatek

Rise From Ashes is an empire-building game set in an ancient, mediaevalesque world ruled by nature, not yet touched by human industrialization. As an orphaned prince of a desolate kingdom, the player must rebuild the once-great civilization from the ground up, managing citizens' rest periods, daily food intake, and job assignments while constructing and upgrading structures. The games low-poly art style evokes the simplicity of the medieval age, emphasizing the raw beauty of the natural world. The procedurally generated world features three biomes with randomly distributed resources, and dynamic difficulty adjustments ensure a unique experience for each player. Citizen management is key to success, with players making strategic decisions on everything from individual job assignments to macro-level resource allocation. Players must fend off invading barbarians and enemy spies infiltrating their kingdom, using everything from defensive structures to combat tactics. With deep strategy elements and endless replayability, Rise From Ashes offers a challenging and customizable gameplay experience that will keep players engaged for hours on end.

Technologies:

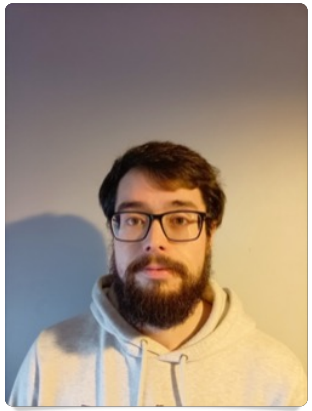
Unity3D, Blender, Krita, C#

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Progressive Web Application for Personal Safety Alerts

TL250 – 38

by Jason Power



Airdeall is a Progressive Web Application (PWA) designed to work as a general purpose SOS alerting application which can be installed on a users mobile device while also being accessible from any device that has a browser. This application gives users the ability to create and activate alerts that can be fully customised with options such as SMS messaging, location information and social media integration. Airdeall will also allow the owner of any kind of business to register with the application, and define their business as a safe point where users can seek refuge if they feel threatened. This approach to safety could be seen as reactive, however Airdeall will also help to provide a pro-active approach by providing a user with helpful tips to ensure they stay safe. The application will provide a simple and easy to use interface which will both allow app users to activate alerts quickly and efficiently and allow anyone with access to use it.

Technologies:

React, JavaScript, HTML/CSS, Firebase, GitHub, WebStorm

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
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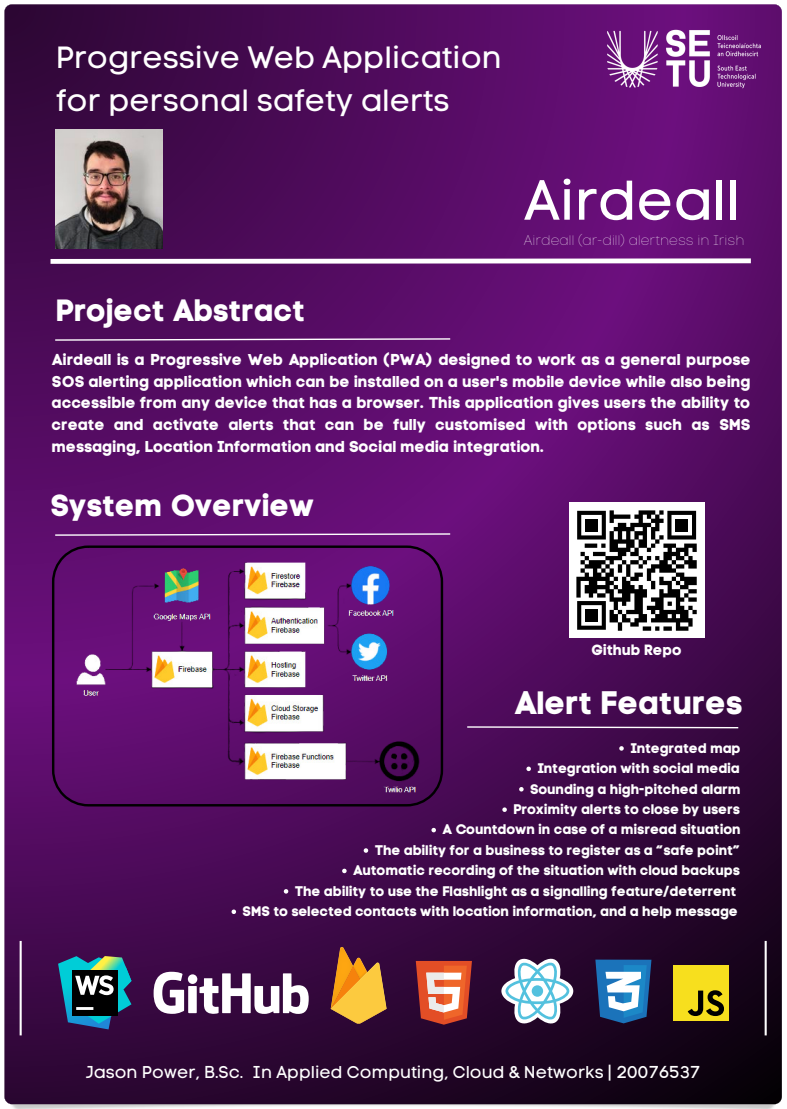

Django-Based Web Application for Upgrading and Configuring Network Devices

TL250 – 39

by Aaron Russell

This project aims to develop a web application named NetNua, which uses the Django web framework with Python, and will allow network administrators to upgrade network devices' firmware easily. Additionally, NetNua will enable administrators to create configuration changes at scale, streamlining network device management. The application will provide a user-friendly interface allowing users to schedule automatic upgrades for their devices and script configuration changes at the touch of a button. The application will be vendor-agnostic, enabling it to be used across various network devices. NetNua will be security conscious, requiring authentication for every aspect, and includes extensive logging for every change. In addition, the application will allow users to easily view the current firmware versions of their network devices, enabling them to maintain an up-to-date log of the device's firmware history. Netnua will help streamline certain aspects of network device management, making it easier for administrators to manage their network infrastructure.

Technologies:

Django, Python, SQLite, GNS3

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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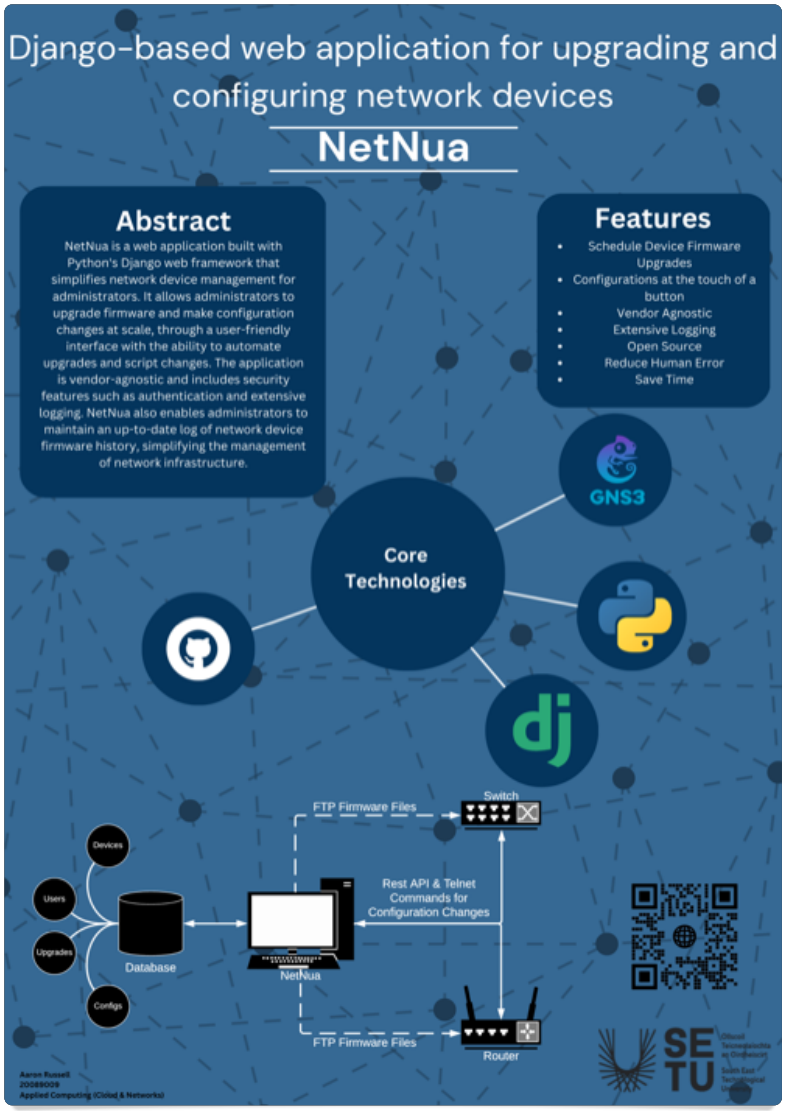
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



Continuous Integration and Delivery, Implemented Using a GitOps Framework

TL250 – 40

by Patryk Stefanski

This project will implement a robust CI/CD framework utilising GitOps principles and various DevOps tools and technologies. The goal of this project is to streamline, through automation, the deployment process, reduce errors and increase productivity in the application development and deployment cycle. Kubernetes will be used as the container orchestrator and Podman as the applications containerisation platform—Helm, to manage Kubernetes resources. While GitHub Actions and ArgoCD will serve as the CI framework, I aim to garner experience and expertise in and through implementing real-world GitOps frameworks using cutting-edge DevOps tools and technologies. The result will provide an ability to recommend different technology stacks for GitOps and CI/CD based on context and project requirements. The end users for implementation of GitOps would typically include the developers and operations teams who are responsible for managing and deploying the applications and infrastructure. The implementation of GitOps would result in a reliable, scalable, and resilient system while also boosting productivity.

Technologies:

Kubernetes, Docker/Podman, KIND, Helm, ArgoCD, GitHub Action, Golang, CI/CD

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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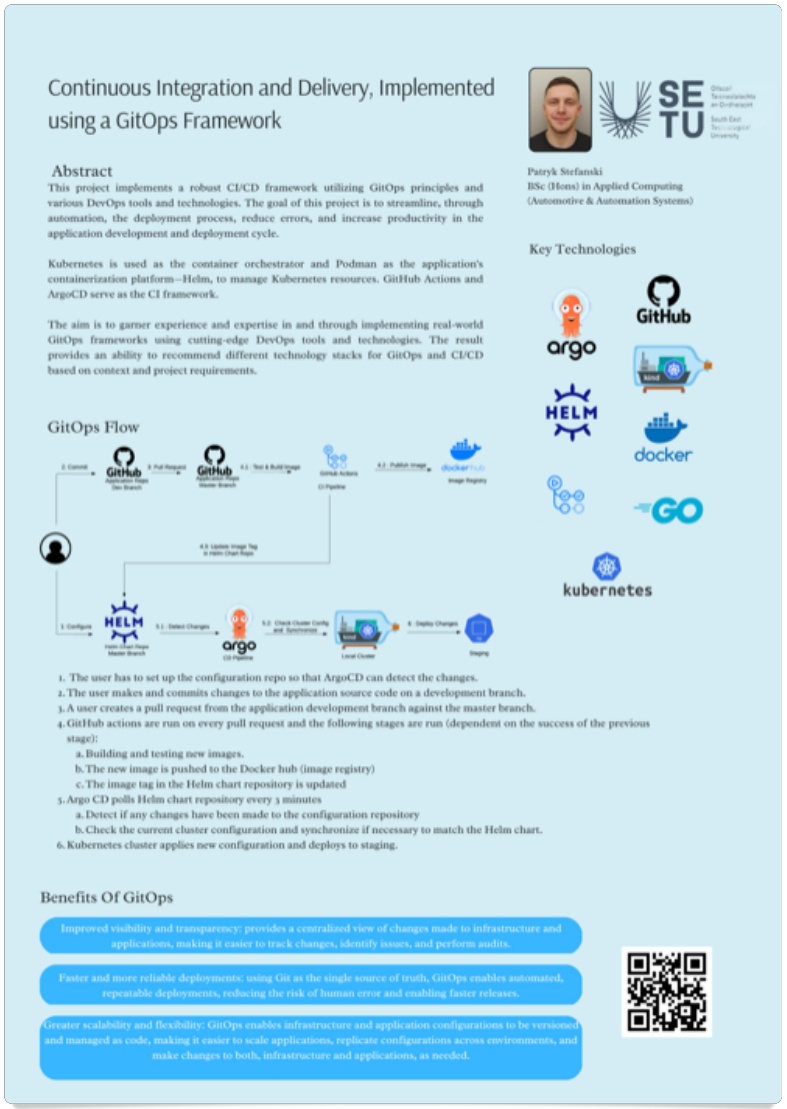


TypeScript Web App Platform for Third-level Esports Students

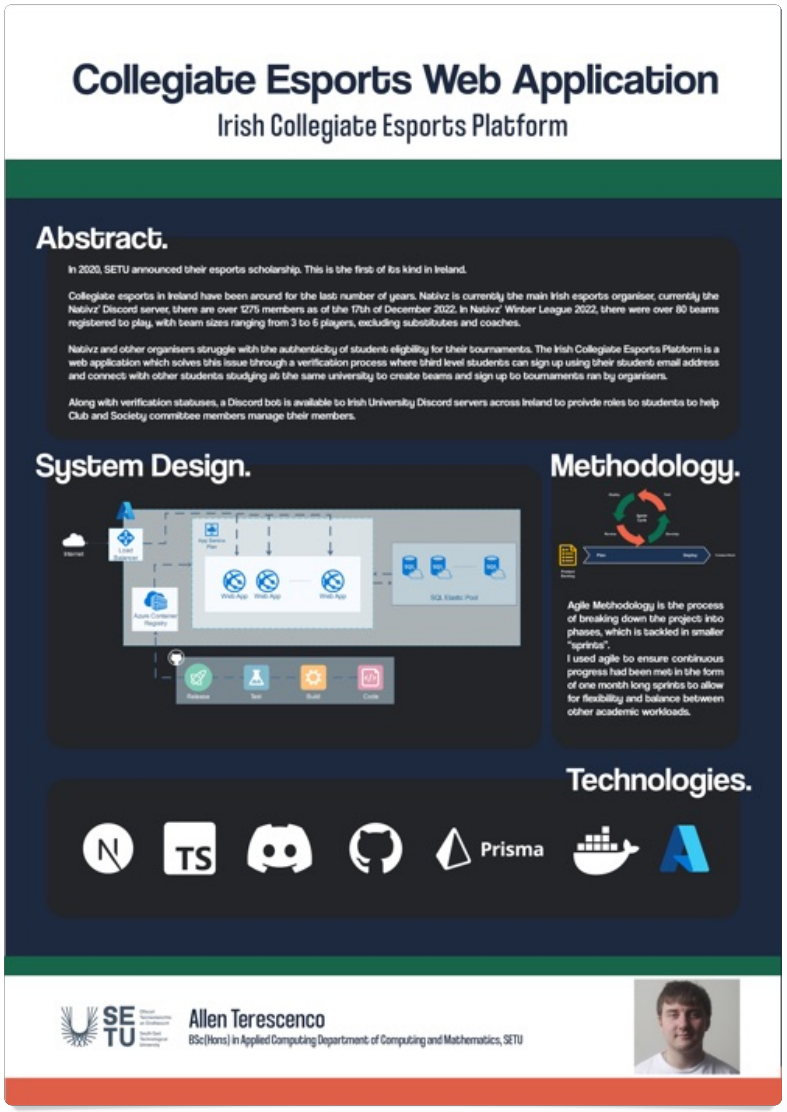
TL249 – 41

by Allen Terescenco

Irish Collegiate Esports Platform is a TypeScript web application where third level students can sign up to connect with other students studying at the same university and create teams to register into tournaments ran by organisers. This project aims to help break down the barrier between organisers having to verify student statuses for university/college only tournaments. Another aim is for connectivity between students who share the same interests in competing in third-level esports competitions. Ireland's National Education & Research Network's service Edugate is being utilised as a way for students to verify themselves as active third-level students to verify themselves to play, similar to how UNiDAYS works. Once a student is verified they can connect with other students on the website to create teams and sign up to tournaments. They can also join their college/university Discord server as another means of connectivity. As this is an issue currently in Esports Ireland as it takes place heavily online.

Technologies:

Next.js, Auth.js, Docker, TypeScript, Azure, Edugate, Prisma, MySQL, NGiNX



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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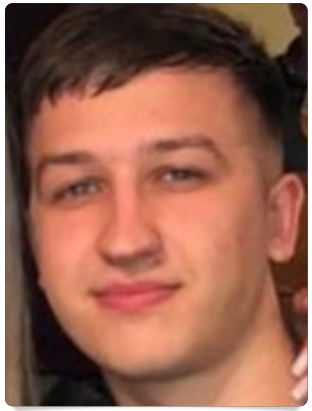
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

New Feature Development with Shortest Path Algorithms

TL249 – 42

by Ernestas Trakys



PROJECT TOPIC Design and Development of a Routing Feature with Real-World Road Incident Data providing Safer Routing Abstract: A Development of a new Road Routing Feature which uses road data gathered from Government websites. The main objective is to provide users with an optional Routing Feature that takes previous road incidents into account before displaying the quickest route to a destination. Understanding, Using and Altering Algorithms that traverse a Network for a specified output. This project helps users that are looking to travel on safer roads to destinations. Travelling unvisited roads can be weary for a lot of people, especially when they might be far from home. This app will provide users with a peace of mind, knowing that they will not be going through blackspots or avoiding poorly developed roads. A website for front-end and user accessibility is enough for the initial service. This will be connected to a created server which is stored and connected to via Cloud Services. Front-end will be created with AWS Services and pointed to the server.

Technologies:

Java, JavaScript, Docker, AWS, Linode, Python, Pandas JSON, GEOJSON

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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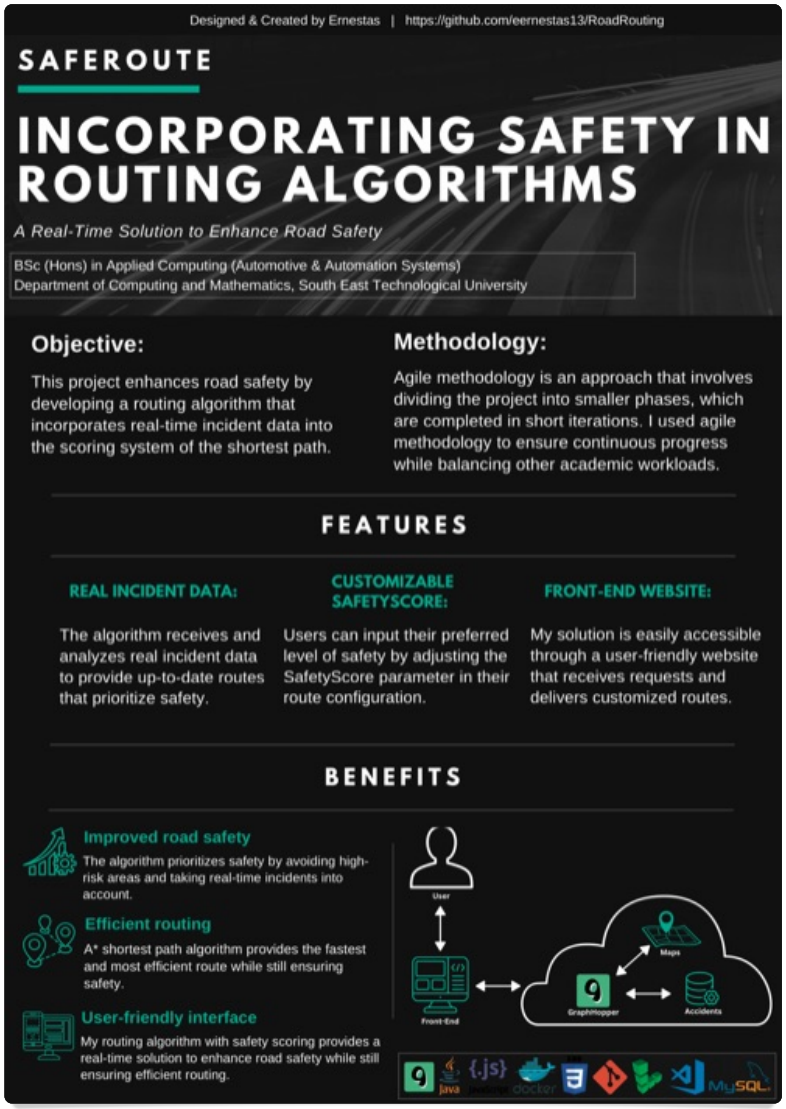

USV LIR 2.0

TL249 – 43

by Dominik Wawak

The USV LIR 2.0 is an unmanned surface vehicle designed to serve as an open research platform. It is named after the Irish legend Children of Lir. This project showcases engineering to school students through a mission design competition and is being used for marine research by biologists from Catholic University of Valencia. The unique aspect of this project is the technology underneath. The master controller, Pixhawk 3, controls the boat with the help of GPS and is connected to a laptop through telemetry communication, while QGround Control is the mission planning software tool used to configure the boat. The microbit interface, a small microprocessor programmed with virtual puzzle blocks, is a standout feature that makes this platform accessible to anyone, regardless of their technical background. My primary focus is maritime search and rescue, using object detection training models and image processing methods to detect and rescue people in risk of drowning. I developed a GUI to provide ease of use for future use. The path planning for the boat is done with common motion planning algorithms like Dijkstra and the communication is done through MQTT.

Technologies:

Python, Tensorflow, Pixhawk, Microbit, MQTT, AWS, Roboflow, OpenCV, QGround

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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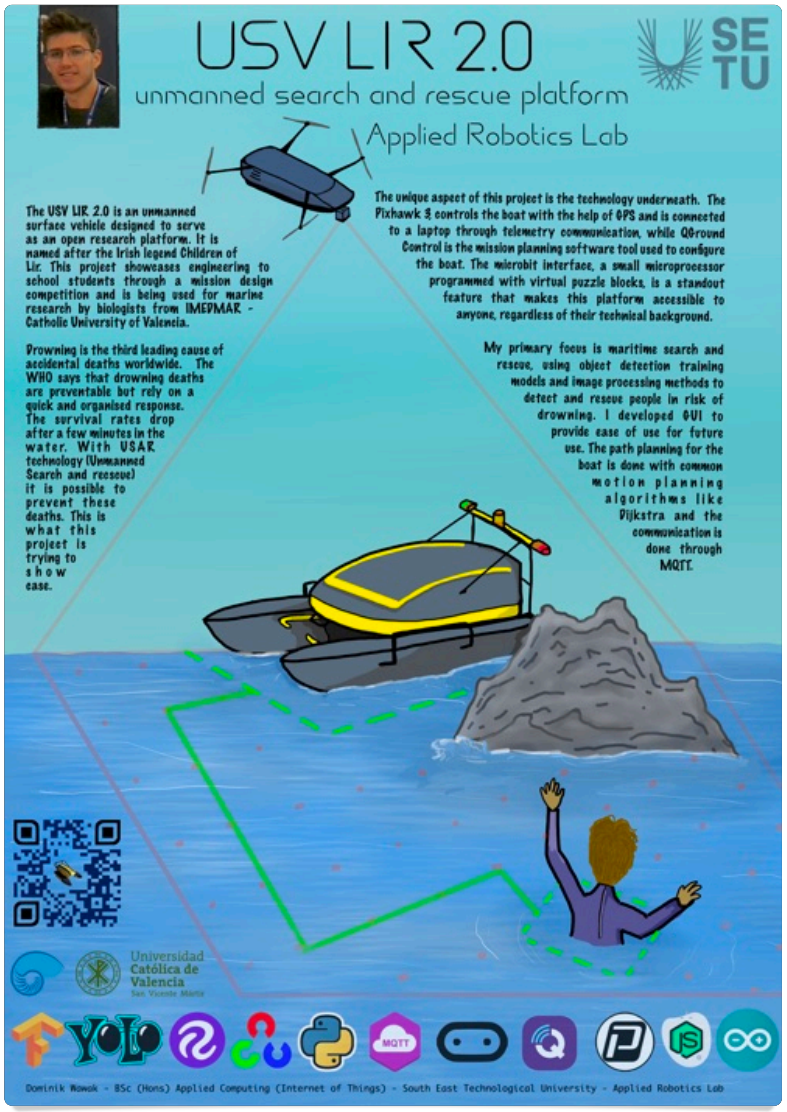
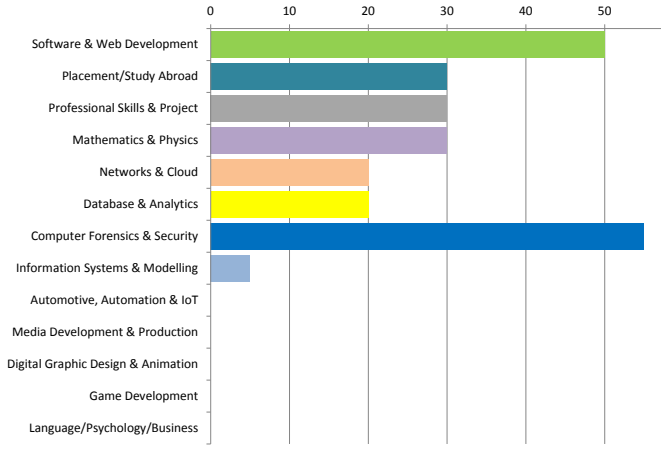


The aim of the BSc (Honours) in Computer Forensics & Security programme is

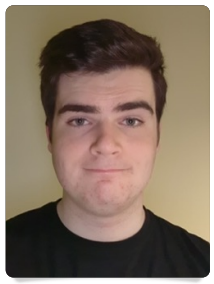
to produce graduates with the necessary knowledge, skills and expertise to pursue a career in computer security and computer forensics. Graduates should be able to build, use and adapt software and hardware solutions to conduct investigations or to secure networks and systems. The course will also confer on the graduates a set of personal and professional attributes that will allow them greater flexibility in the development of their own career options. Specifically the course aims to produce graduates who can

- Reason and problem-solve to a high level in the area.
- Design specific security solutions.
- Provide security support to systems development teams.
- Participate constructively in the deployment of new security technologies.
- Participate in the development of forensic solutions in response to a security solution.
- Undertake research-based projects where required.
- Manage technology-based projects that require the handling of innovation and change in dynamic environments.
- Present and communicate clearly.
- Work with others in a group environment.

The breakdown of course credits across the four years on each specialism is illustrated by the following chart.



Projects


Niall Crowe


Gowriswarup Kailas Perumal

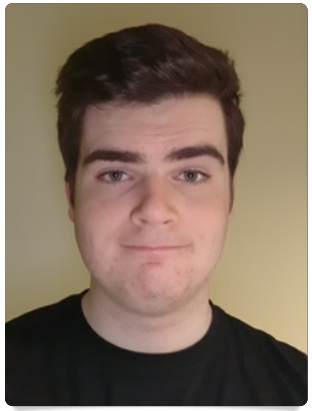

Emran Sabbagh


Durgaashini Sagaran

EPods: Podman-based EBook Manager

TL249 – 44

by Niall Crowe



EPods is a React-based web application that allows users to manage the eBook catalogue. The web application landing page lists all the user's eBooks, showing each ones cover, title and author. Clicking a book takes the user to its detailed page, which includes metadata such as the publication date, genre, word count, and ISBN. From there, users can read the book using a third-party reader component embedded in React. If a user has already started reading, the application will return them to their last read page. The metadata for each book is scanned and gathered by a Golang web API (which utilises the GIN framework) and stores the data in an AWS RDS database for future use. The Golang web API runs inside a container created by Podman, a daemonless container engine for creating, managing and running OCI Containers. This container will run inside an AWS EC2 instance. The React frontend is deployed on an AWS S3 bucket designed for web hosting. As both of these components are running inside AWS services, the user can read their eBook files from any location at any time. Users can also update or delete books from the web application.

Technologies:

React, Golang, Gin, AWS

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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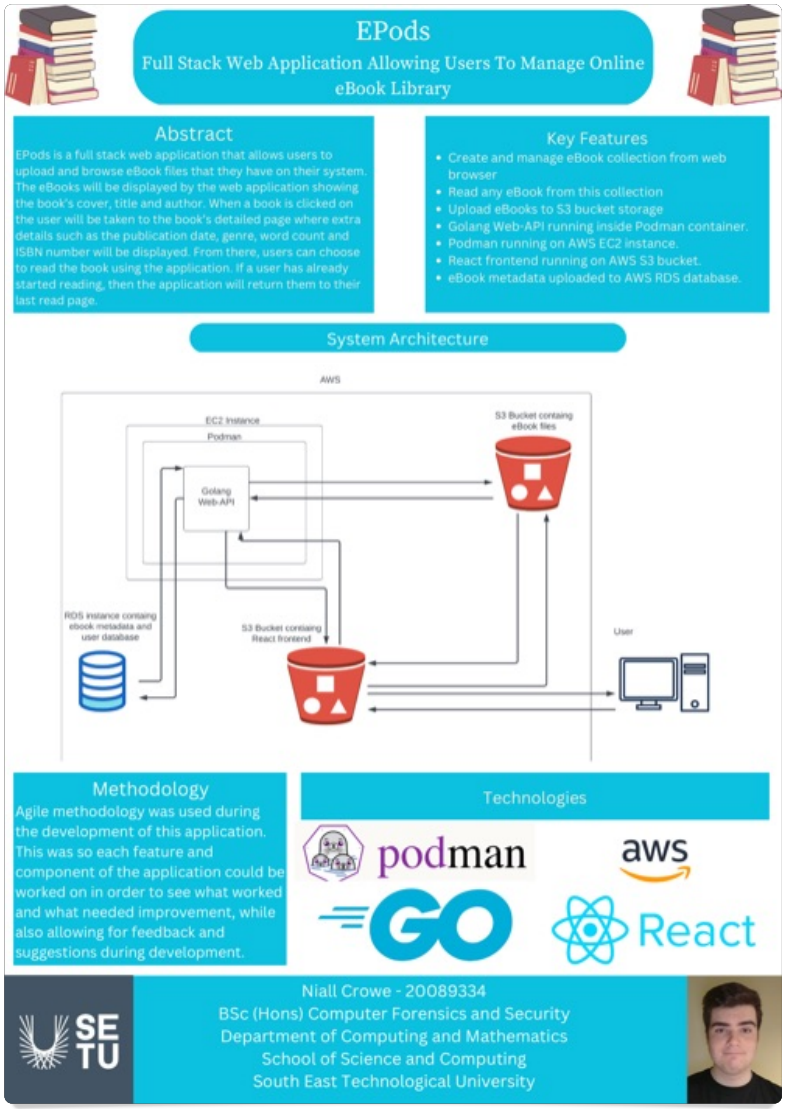

Strengthening Cybersecurity for Smart Homes and Open Networks: A Threat Detection and Portable Exploitation Model

TL249 – 45

by Gowriswarup Kailas Perumal

In the age of digital technology cornering virtually every aspect of human convenience, as reliance on smart devices and home networks continues to grow, so do the risks of cyber threats. In response, a plug-and-play Threat Detection Model has been developed for home networks. This model is designed to automatically scan the network and connected devices, and alert users via an Android application of any unrecognized intrusion activity or network scans, as well as any new devices connected to the network. The model is easy to configure with the help of an installation manager and includes all required dependencies and automation scripts. To test the model's effectiveness, a Portable Exploitation Device is also developed. This allowed for a more comprehensive understanding of the model's capabilities and raised awareness of the severity of cyber threats. The project will also be published on GitHub for interested individuals to test on their own networks. Its open-source nature allows for more comprehensive improvements. The primary aim of this model is to enhance cybersecurity in the age of digital transformation and promote safer and more secure use of technology in households

Technologies:

Raspberry Pi 4B, Kali Linux, Python, Kotlin, Github, Android Studio

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Desktop App Notification System for Scanning Areas for Ships

TL249 – 46

by Emran Sabbagh

Gathering and analyzing open-source information or data has become very popular in the past 10 years. This type of data can be gathered from multiple sources on the internet including social media and more specialized sites (news, ship tracking, or flight tracking). This desktop app, that features a graphical user interface, seeks to help ship tracking enthusiasts to gather data about ships in a specific area. It is based on Python and JSON, and Marine Traffic website data, and it automates the tracking of ships within a specific area (based on longitude and latitude) and timeframe and alerts the user accordingly, providing more information on relevant ships (e.g. length, drought, width, etc.). The app also provides other useful services such as database storage for the Marine Traffic API key hash value, data analysis report, Twitter scrapped data, and AI/ML generated data which are very useful for users by making data acquisition less expensive.

Technologies:

Python, SQL, JSON, MySQL (PhpMyAdmin), Marine Traffic API, PyCharm IDE

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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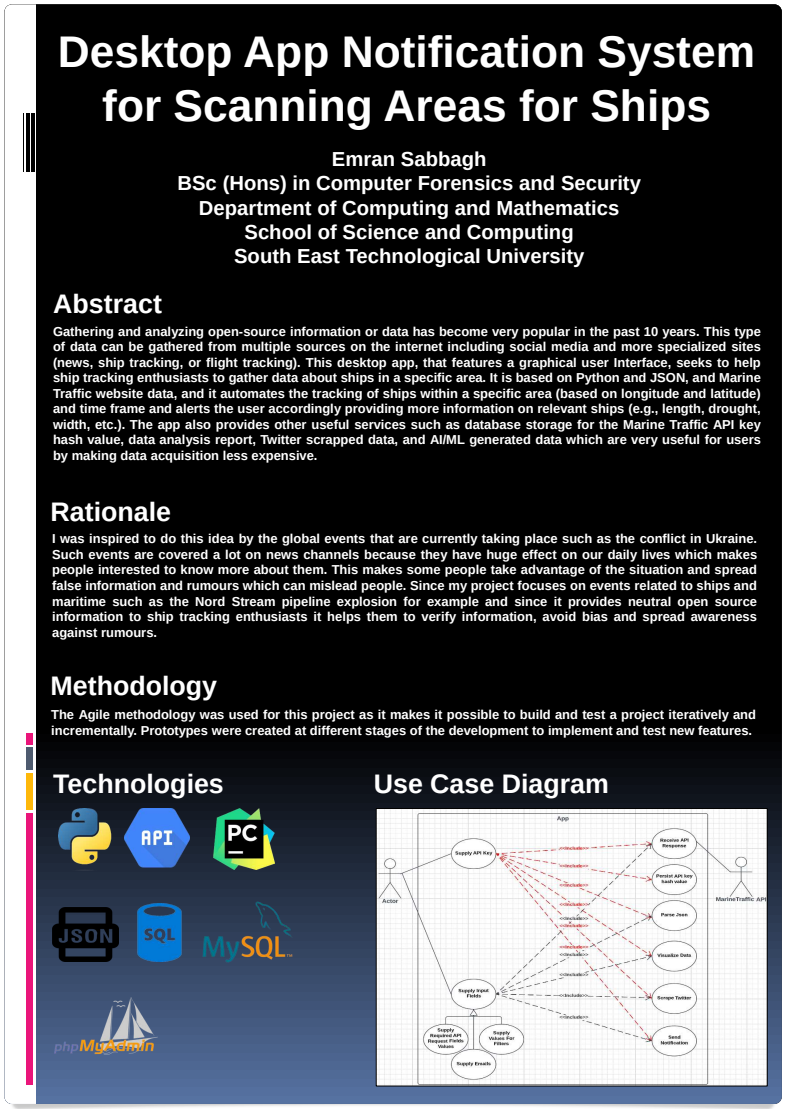

Development of a Mobile App for ADHD Users

TL249 – 47

by Durgaashini Sagaran

ADHD (Attention Deficit Hyperactivity Disorder) is a neurobiological condition which affects people's behaviour. Users with ADHD frequently struggle with attention, organisation, and time management, which can have an impact on their daily functioning. In this project, the aim is to create a mobile application that will assist ADHD users in managing their symptoms and increasing their daily productivity. The app was created through an iterative design process using Agile Methodology, using research from both ADHD users and relevant healthcare professionals. Reminders, time management tools, and task management tools are all included in the app. The most important feature of the app allows users to track the time it takes to travel from one location to another using the Google API, which can be a useful tool to help users with ADHD better manage their time and plan their daily activities.The mobile application will be developed in Android Studio Code using the Kotlin programming language. Overall, this project makes an important contribution to the development of digital health interventions for ADHD users and has the potential to improve their daily functioning and quality of life.

Technologies:

Kotlin, Android Studio Code, Figma, Firebase

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

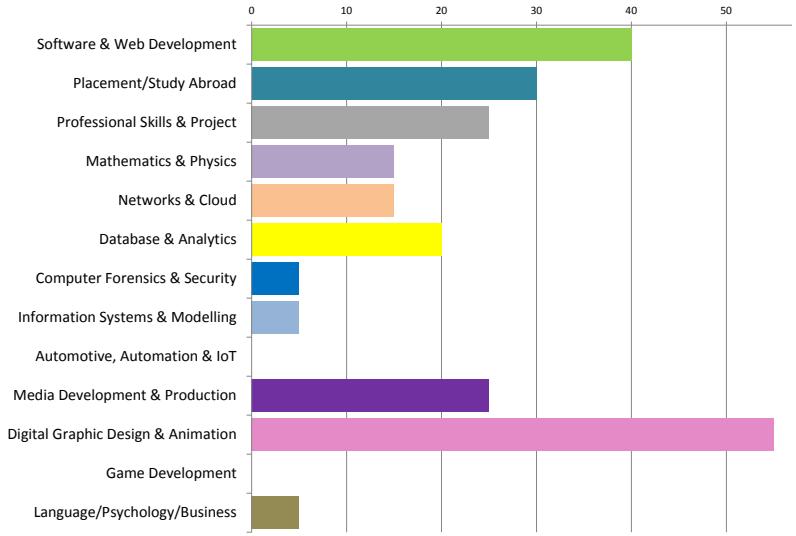
BSc (Hons) in Creative Computing

The **BSc (Hons) in Creative Computing** is a four–year Level 8 programme. Many students transfer to the final year of the programme having completed the Level 7 **BSc in Multimedia Applications Development**.

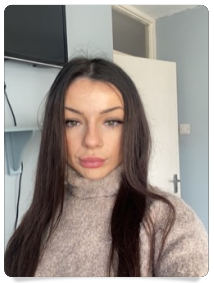
The aim of the BSc (Hons) in Creative Computing is

To provide students with the knowledge and practical experience of industry standard innovative tools and technologies, within the domains of technology and creative media. This enables graduates to pursue a career in both the computing and creative media industry. Ireland's globally recognised digital and creative economy has experienced significant growth in recent years. Enterprise Ireland aims to expand even further the export footprint of this growing sector, and skilled workers are required to do this. Creative Computing graduates will be qualified to fulfil the needs of this sector and many others.

The breakdown of course credits across the four years on these programmes is illustrated by the following chart.



Projects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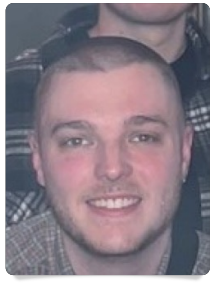
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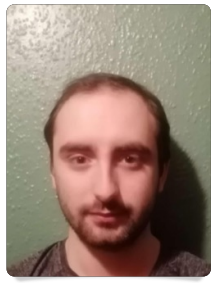
Michael Hart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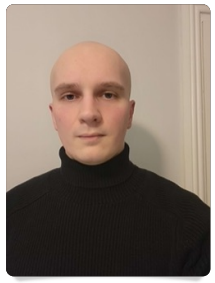
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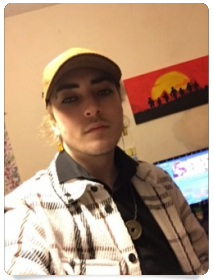
Jack McGrath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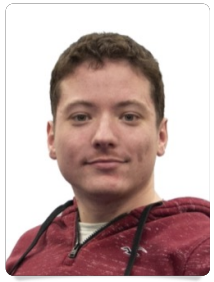
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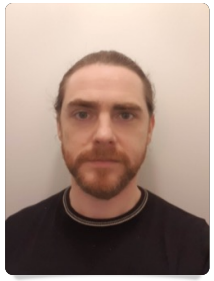
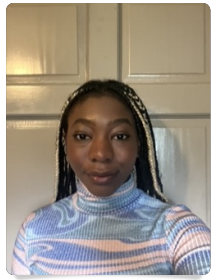
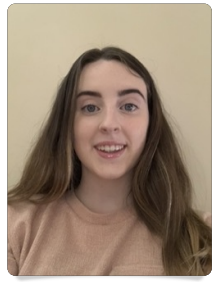

Barry O'Donnell


Kate O'Neill


Oluwasimisola Popoola


Emma Roche

2D Animated Biographical Documentary

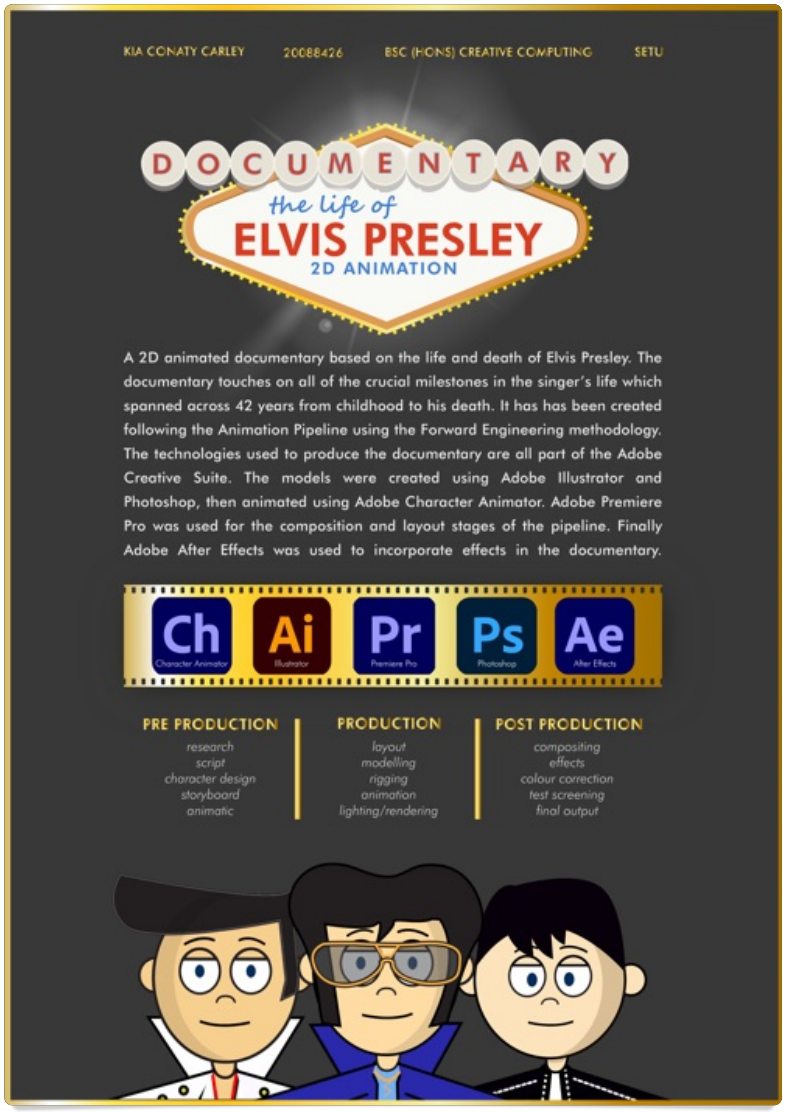
TL228 – 13

by Kia Conaty

A 2D animated short film based on the life and death of Elvis Presley which will be narrated by a voice over actor sourced locally. The genre of the film will be historical. The type of film will be a documentary. As the type is documentary the information provided will be non fictional and sourced from existing factual information about the singer. It will touch on all the crucial milestones in the singer's life which spanned across 42 years from childhood to his death. The singers life story will be told in linear order. Other important characters in the singers life will be portrayed in the documentary also. The idea is novel as there are no animated short films with such high level of detail about the singers life. For this project there is a wide range of potential target audiences. As Elvis Presley is so well known, the film is not limited to one particular age range. The story will be conveyed in an informal but informative manner, which can be understood by any age.

Technologies:

Adobe Character Animator, Illustrator, Premiere Pro, After Effects

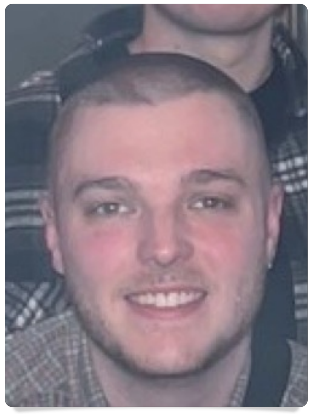


Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Self-Produced Electronic Music Video - 'The Masked Man'

TL228 – 14

by Josh Deegan

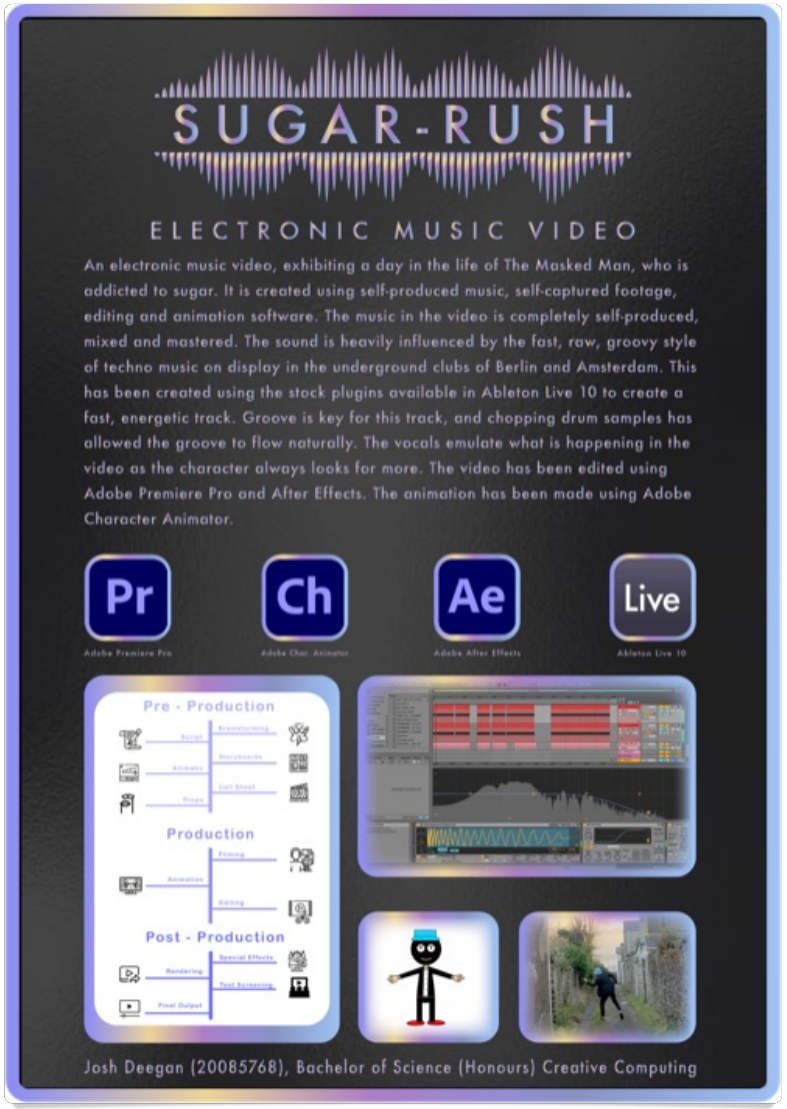


Electronic Music Video documenting a day in the life of The Masked Man using self-produced music, self-captured footage, editing, and animation software. The masked man is known around the town for being an absolute nobody. His only life purpose seems to be consuming sugar and listening to techno music. This video will follow the man from when he wakes in the morning to when he passes out at night, showing all the no-good activities that the man gets up to during the day. The music for the video will be self-produced, mixed, and mastered using Ableton 10. The footage will be self-captured and edited using Adobe Premiere Pro and Adobe After Effects. The video will contain some animation created using Adobe Character Animator. The genre of music is techno, which is a passion of the producer who takes inspiration from the late 90's - early 2000's. The theme of the music video is addiction and loneliness. The character has nobody to support him and is addicted to a substance. The director plans to show this very clearly in the video by showing his daily routine and sugar consumption throughout the day, while not straying too far into the world of drugs.

Technologies:

Ableton 10, Adobe Premiere Pro, Adobe After Effects, Adobe Character Animator

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



Hybrid 2D/3D Animated Short Film

TL228 – 15

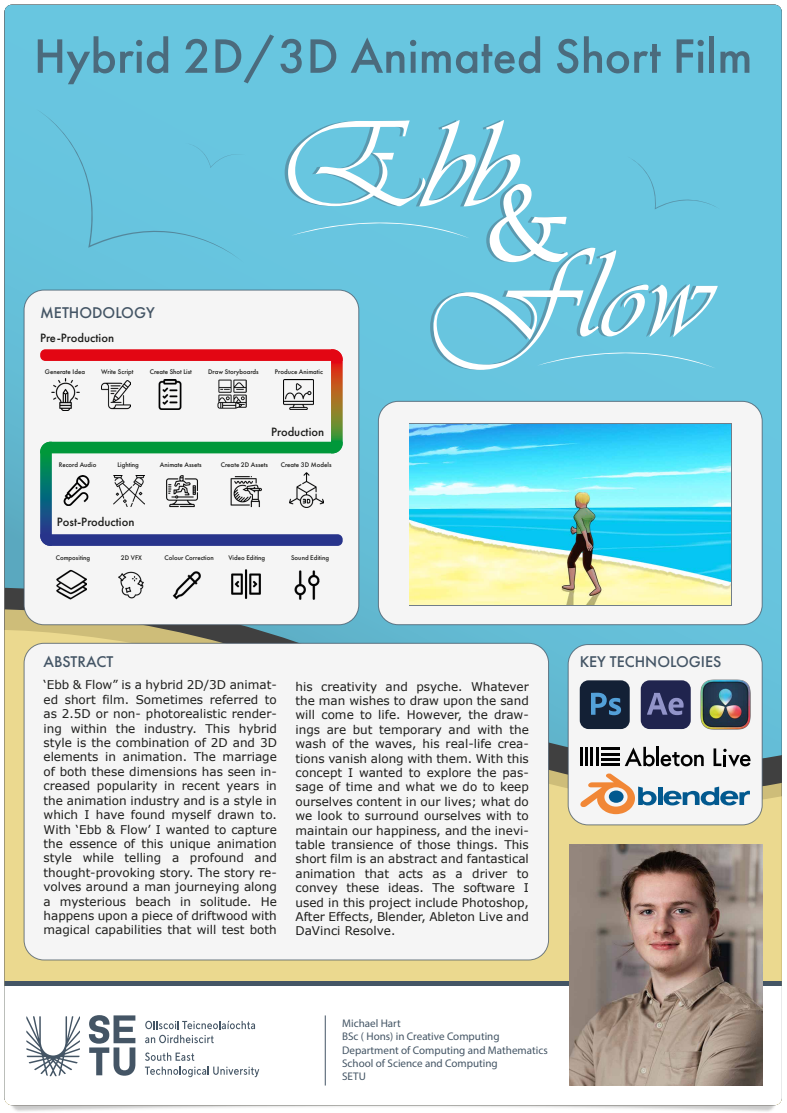
by Michael Hart

'Ebb & Flow' is a hybrid 2D/3D animated short film. Sometimes referred to as 2.5D or non-photorealistic rendering within the industry. This hybrid style is the combination of 2D and 3D elements in animation. The marriage of these dimensions has seen increased popularity in recent years in the animation industry and is a style I have found myself drawn to. With 'Ebb & Flow' I wanted to capture the essence of this unique animation style while telling a profound and thought-provoking story. The story revolves around a man journeying along a mysterious beach in solitude. He happens upon a piece of driftwood with magical capabilities that will test both his creativity and psyche. Whatever the man wishes to draw upon the sand will come to life. However, the drawings are but temporary and with the wash of the waves, his real-life creations vanish along with them. With this concept I wanted to explore the passage of time and what we do to keep ourselves content in our lives; what do we look to surround ourselves with to maintain our happiness, and the inevitable transience of those things. This short film is an abstract and fantastical animation that acts as a driver to convey these ideas.

Technologies:

Photoshop, After Effects, Blender, Ableton Live, Audacity, DaVinci, Resolve

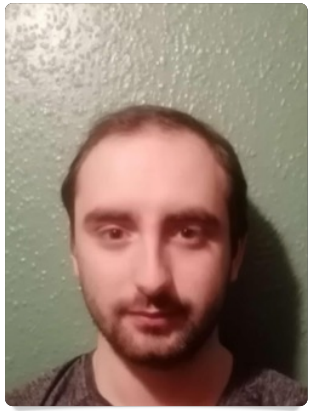
Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



3D Third Person Open World Game

TL228 – 16

by Darren Kidby



For this Final Year Project, the goal was to create a third person open world game that had a variety of different levels to complete. These levels would unlock after each level is completed. The game has two characters to select from, Jason and Catherine. The game ends when you complete all the levels. The story of the game is that a game company decided to start a competition. They put out multiple different puzzles and challenges around the city. The first sixteen people to complete all these challenges get to advance on to a tournament. The winner of the tournament gets free subscription to their gaming services for a year, with a healthy cash prize as an award. It was important to research through YouTube and a variety of websites to help understand the software and to get to know all the different ways to create a game. As a student that had no prior experience in game development and in the blueprint style of creating games, this method of learning was really important. Watch multiple videos on a topic, learn from it and then create from what was learnt.

Technologies:

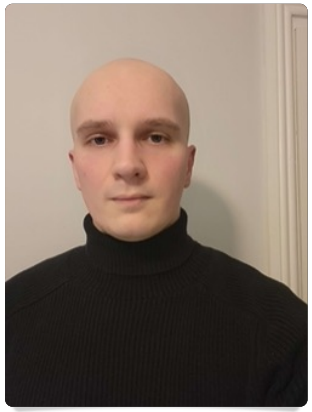
Unreal Engine, Autodesk Maya, Photoshop

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Azul-Link

TL228 – 17

by Dariusz Ligas



Azul-Link is an RPG (Role playing game) and is an open world adventure with various levels and tasks to explore. The goal of the game is to rescue a captured princess. I am developing the game using the Unreal engine 5. Methods I am learning from YouTube videos and various websites online. I am following a system called the 8 P's. Proof - learn from the tutorial and then do it yourself. Passion - have fun doing it. Patience - it takes time to learn and develop. Purpose - have a goal, see what you want to learn. Presence - accountability, and deadlines. Persistence - do it as often as possible. Prevention - if you get burned out take a break and distract your mind. Perseverance - learn at your own pace. Results to date is that I have developed the following in my game: Main Menu System, Pause Menu, Options Menu, Death screen, Loading screen, Respawn Ragdoll system, Pick up system, Health and health bar system, Damage system, Stamina and stamina bar system, AI random roam system, AI chase player system, Portal system, and Fall damage system. I also aim to develop a combat system, Talk and quest system, interaction and weather system.

Technologies:

Unreal Engine 5, Autodesk Maya, Adobe Photoshop

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Short 3D Animated Film: ”Catch”

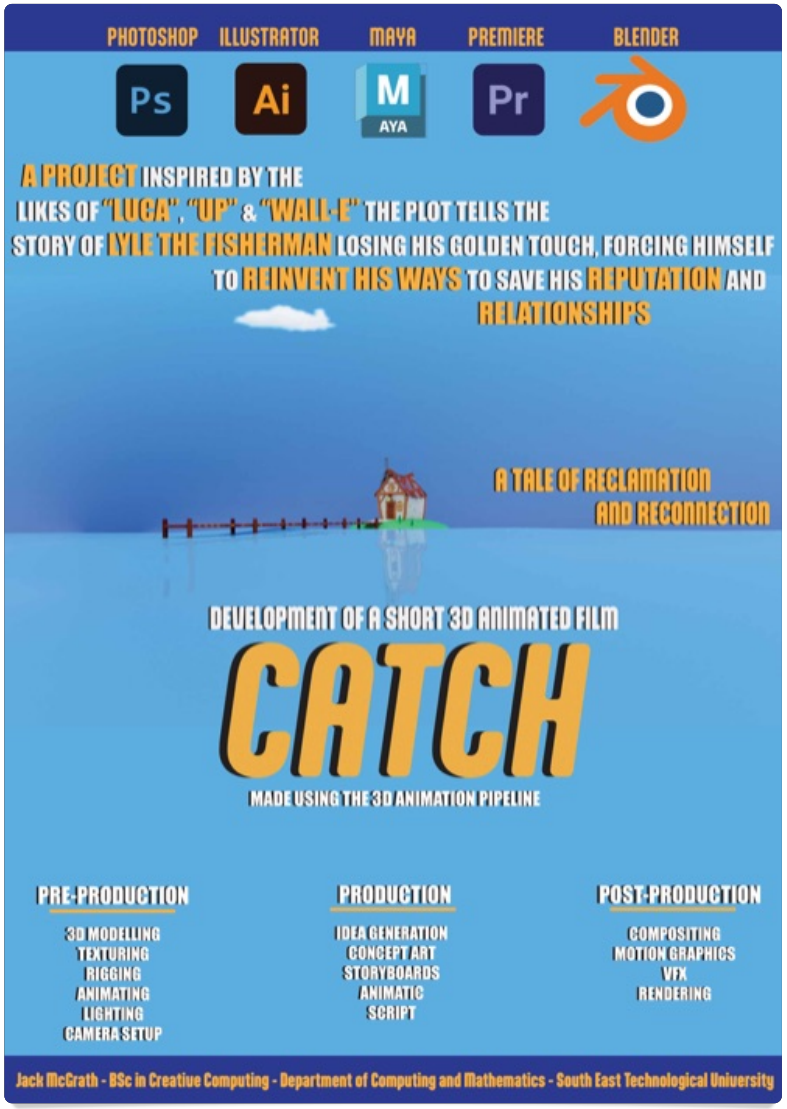
TL228 – 18

by Jack McGrath

This final year project is a short 3D animated film where the plot follows the main character, Lyle, a lonely fisherman struggling to do what he does best, catch a fish. The story follows the brute determination of Lyle and his repeated approach, failing to learn anything from his past attempts. The story holds under themes of a complex relationship and reconnection. Lyle must change his ways to get back what he has lost, his relationship with his son, Luke, and his legendary fishing skills, all of this taking place on his remote island home. The short film follows the 3D animation pipeline, it has been created using various industry standard softwares such as Autodesk MAYA, Adobe Premiere Pro, Adobe Photoshop, Adobe Illustrator and also Blender. The story structure makes use of Pixars “Story Spine” method and is influenced by numerous popular animated movies such as “LUCA”, “UP” and “La Luna”. This project is created from 3 key areas, primarily Animation with a mixture of Digital Graphic Design and Media Development & Production.

Technologies:

MAYA, Blender, Adobe Premiere Pro, Adobe Photoshop

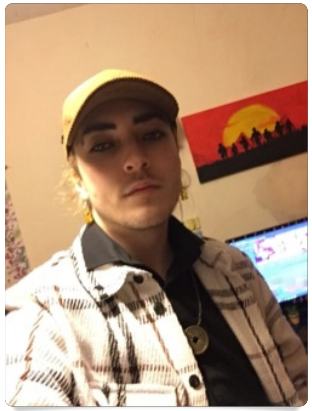


Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

History of Viking and Norman Age Waterford

TL228 – 19

by Jack Noonan



This project is a documentary/video essay detailing the history of Waterford, specifically during the Viking and Norman occupation. The video illustrates the lifestyle of Waterford inhabitants and significant events during both the hazy history of Waterford Viking past and its more detailed and documented Norman past. The goal of this project is to educate the viewer but more importantly, encourage them to learn about Waterford. It aims to give enough context and history to make the viewer interested but not overwhelmed, to inspire them to learn more to answer any questions that have arisen for them. Inspired by online content creators such as Jacob Geller from Youtube, this project aims to keep the information provided as entertaining as possible without overwhelming the viewer. This project is made using 3 mediums: 3D animation, 2D animation, and Live footage.

Technologies:

Blender, Adobe Animate, Adobe Premier Pro, Adobe After Effects

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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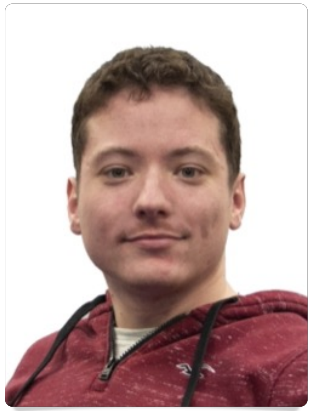
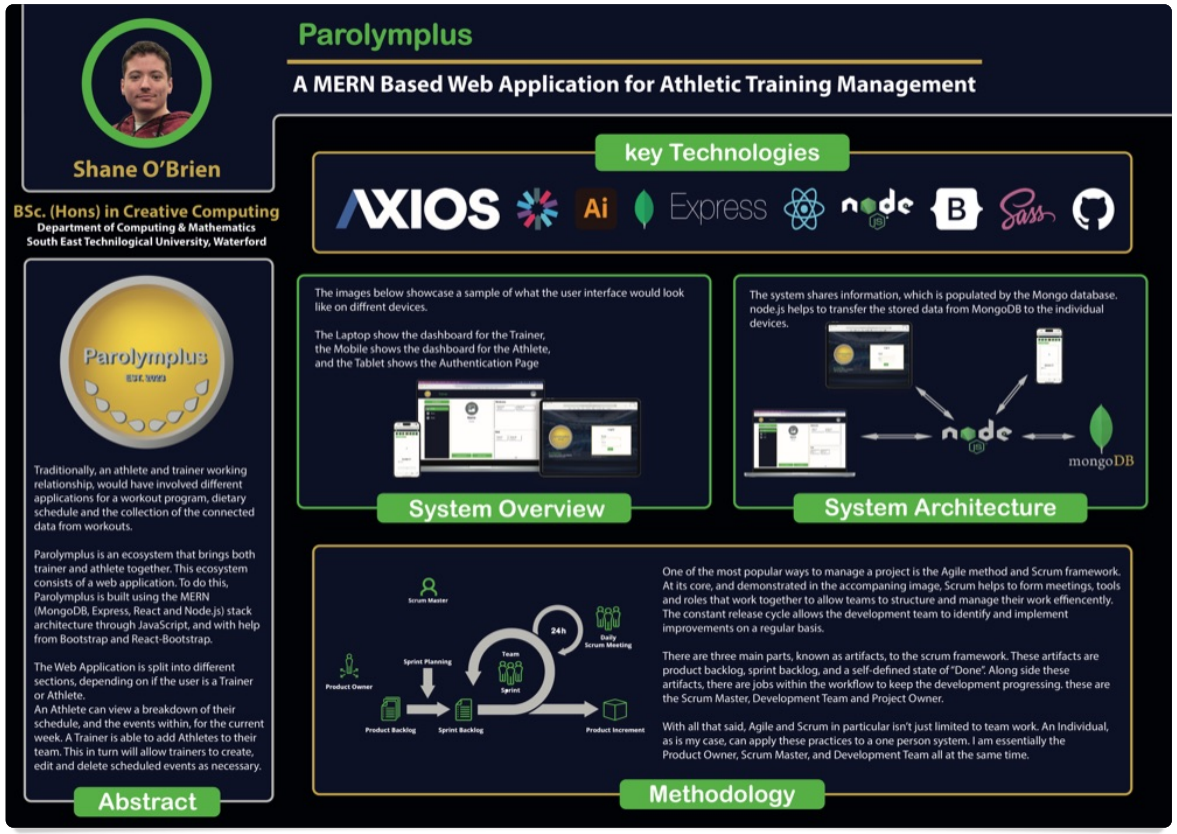
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Parolymplus: A MERN Based Web Application with Phone and Watch Integration

by Shane O'Brien



Traditionally, an athlete and trainer working relationship, would have involved different applications for a workout program, dietary schedule and the collection of the connected data from workouts. Parolymplus is an ecosystem that brings both trainer and athlete together. This ecosystem consists of a web, mobile and watch application. To do all of this, Parolymplus is built using the MERN (MongoDB, Express, React and Node.js) stack architecture through JavaScript, and with help from the native languages of Apple and Android devices, Swift and Kotlin. The web application is split into different sections, depending on if the user is a trainer or athlete. An athlete can view a breakdown of their schedule, and the events within, for the current week. A trainer is able to add athletes to their team. This in turn will allow trainers to create, edit and delete scheduled events as necessary. The mobile and watch application will allow an athlete to start a workout and log data that is connected to the workout. All of this is also available to view on the web application.



Technologies:

MongoDB, Express, React, Node.js Illustrator Swift, Kotlin

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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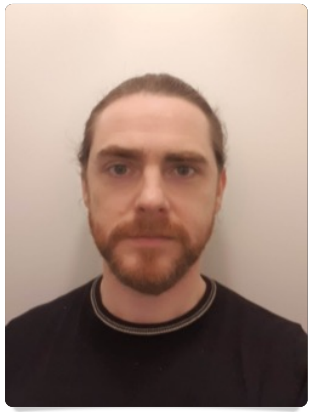
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Lets Roll

TL228 – 21

by Barry O'Donnell



My plan is to create an app that is used to roll 3D dice for tabletop games such as Dungeons & Dragons or Pathfinder. It will have the ability to roll any number of 4-, 6-, 8-, 10-, 12- and 20-sided dice. The dice will roll and show the outcome up on screen. I intend to use UNITY to develop most of this app alongside 3D softwares like MAYA and Blender to build 3D assets like dice and backgrounds. Over the lockdown I started playing Dungeons & Dragons as way to escape and to hangout with friends, all be it online. To play the game, we used a website called Roll20.net which allowed us to move tokens and roll dice. After playing for a few weeks, I discovered they had a 3D dice feature which rolled 3D dice on the screen in front of you, which really helped with the immersion. The app will allow you to roll 3D dice on your phone and will display the number rolled on the screen, as well as in the case of multiple dice add up and display the number. You will also be able to change the colour of the dice to suit your character and the space you are rolling on to suit your in-game surroundings.

Technologies:

C#, Autodesk Maya, UNITY, Blender, Adobe Illustrator, Adobe XD, VisualStudio

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Responsive CSS Framework for Dark Mode Design

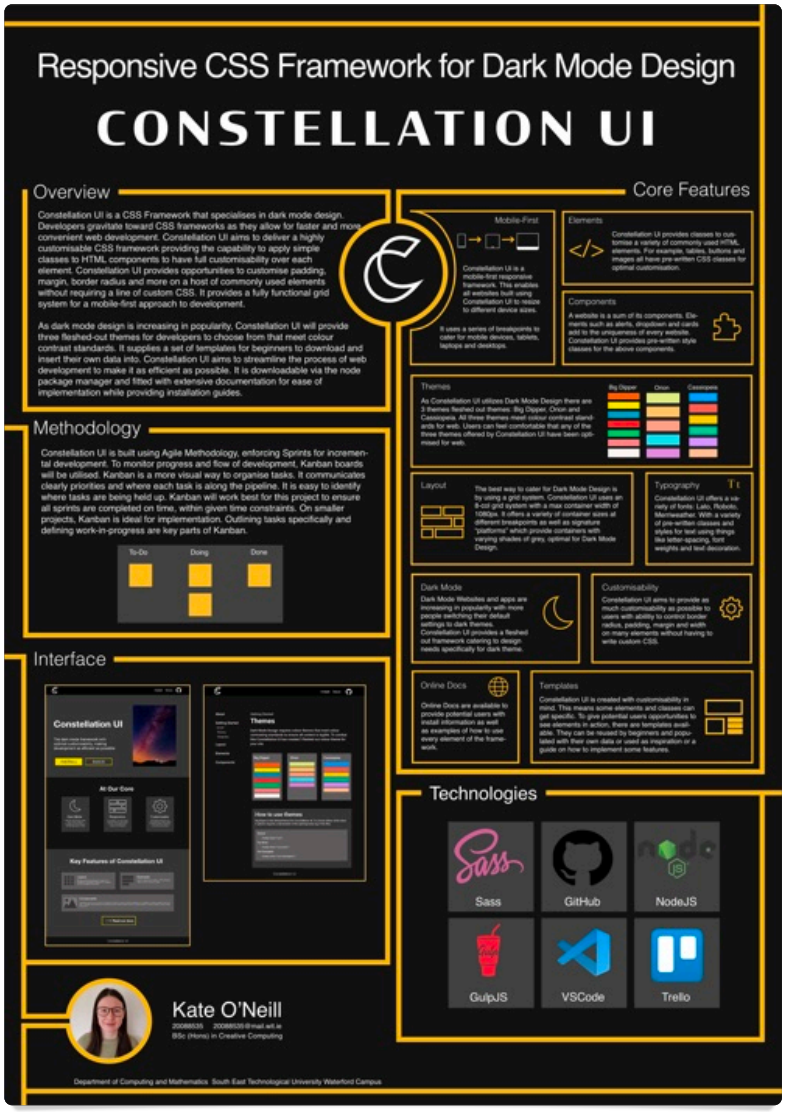
TL228 – 22

by Kate O'Neill

Constellation UI is a CSS Framework that specialises in dark mode design. It aims to deliver a highly customisable CSS framework providing the capability to apply simple classes to HTML components to have full customisability over each element. It customises a host of commonly used elements without requiring a line of custom CSS. As dark mode design is increasing in popularity, Constellation UI will provide 3 fleshed-out themes for developers to choose from that all meet colour contrast standards as well as supplying a set of templates for beginners to download and insert their own data into. It is downloadable via nNPM and fitted with extensive documentation for ease of implementation while providing installation guides.

Technologies:

SCSS, JavaScript, node.js, HTML, VS Code, GitHub, Gulp



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Augmented-Reality Social Media Game

TL228 – 23

by Oluwasimisola Popoola

This project is focused on creating an immersive Augmented Reality experience for social media applications that promotes sustainable forestry through simple gameplay. Deforestation is one of the most important issues of our time, and this game will shine a light on it in a more easily digestible way. Filter games differ from the traditional augmented reality game as they are playable within a social media application, with the end goal being that the user posts the clips of their gameplay to their feed for others to see. This game will be created using in Meta Spark Augmented Reality Studio, with original assets, sound effects and patches created specifically for this game using other technologies such as Maya, Illustrator and Digital Audio Workspaces.

Technologies:

Meta Spark AR, Maya, Illustrator, Ableton, JavaScript

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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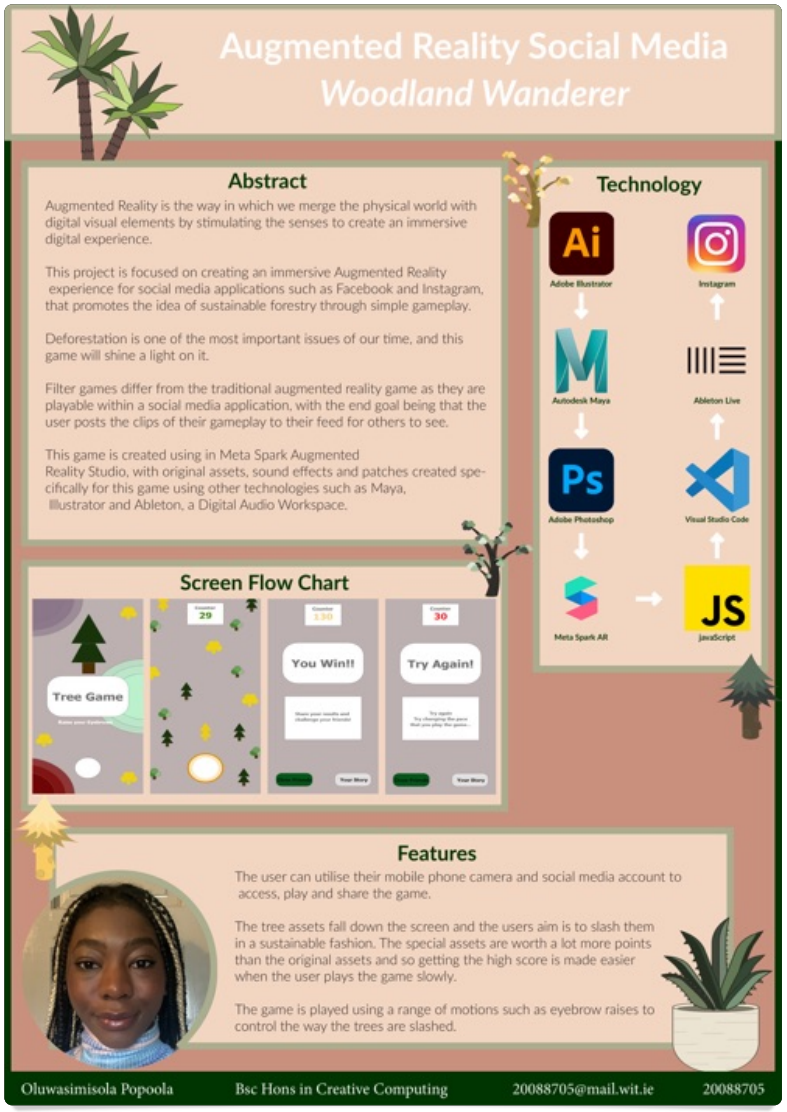
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



iOS-based Career Guidance Assistant Application

TL228 – 24

by Emma Roche

The Careers Guidance App

is designed to aid people searching for third level undergraduate courses. In order to help provide users with the necessary information and support during their course search, the Careers Guidance App includes a course matching questionnaire. This questionnaire asks the user questions related to their interests and skills, both personal and academic. Once the user completes the questionnaire, course suggestions are generated that best match their personality traits, skills and interests.

Technologies:

Swift, SwiftUI, Xcode, GitHub, Firebase

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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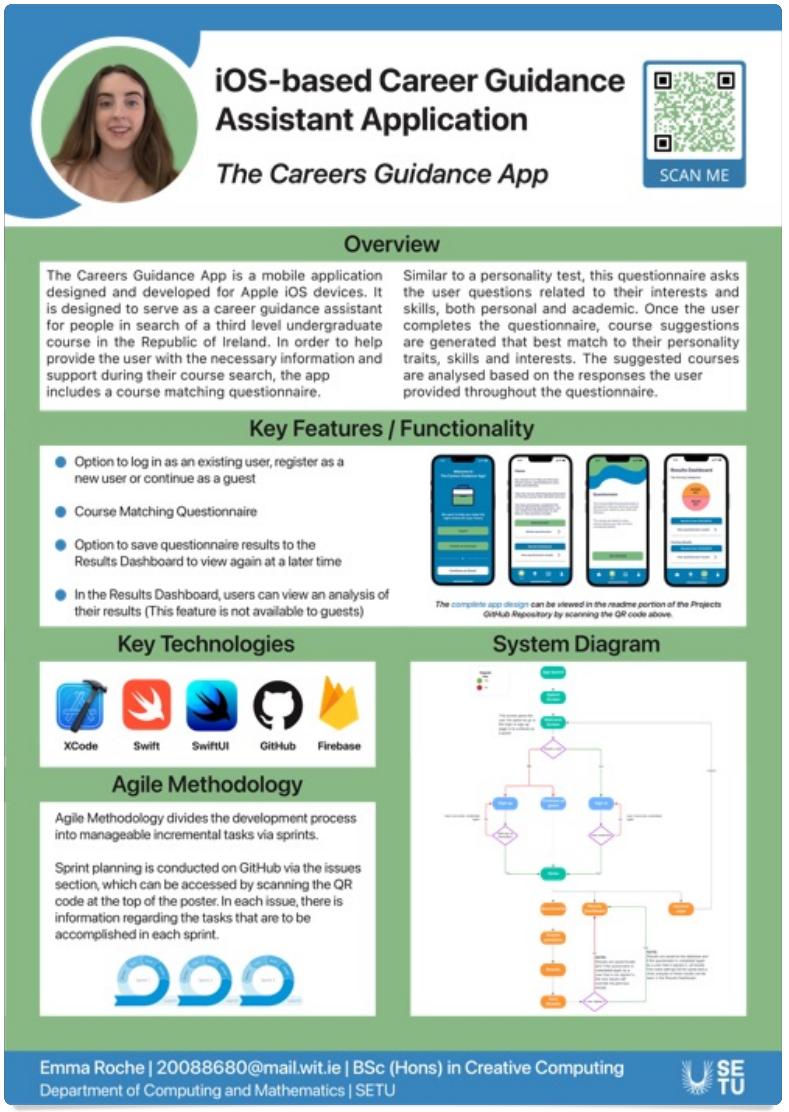


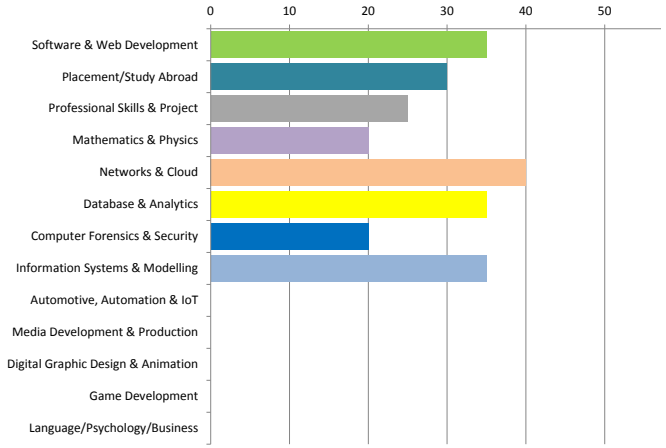
BSc (Hons) in Information Technology Management

The **BSc (Hons) in Information Technology Management** is a one–year add–on to the **BSc in Information Technology**. Across the four years of the programmes there is an emphasis on developing strong networking and cloud computing skills allied to a core of database and information systems knowledge.

The aim of the BSc (Hons) in Information Technology Management is

to provide graduates with a focus on the integration of heterogeneous computer systems and the management of various ICT services to support organisations to use diverse types of technology effectively and efficiently. It also aims to provide graduates with the knowledge and skills to handle and transmit data in a secure and safe manner across different types of networks.

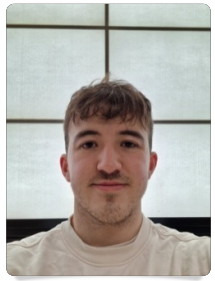
The breakdown of course credits across the four years on these programmes is illustrated by the following chart.

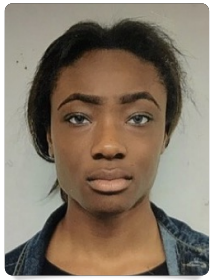


A distinctive feature of this programme is that the final year project is worth 10 credits. There is also an emphasis on data–related and research–led projects as distinct from development–type projects.

Projects


Ian Carpendale


Kieron Dalton


Karen Ogiugo

What Impact Can the Adoption of Blockchain and Cryptocurrency Have on Developing Countries?

TL252 – 1

by Ian Carpendale

Technology is ever growing and evolving in different ways, if we wish to utilize any opportunities to improve the standard of technology in many different sectors it is important to stay informed on emerging ideologies and projects. There has been an ever growing attraction and adoption to the use of cryptocurrency and blockchain technology within a wide array of sectors worldwide, ranging from government, healthcare, education, financial and many more sectors. This research work seeks to investigate the impact the adoption of cyrptocurrency blockchain technology on developing countries and provides evidence of use cases of this adoption within a chosen few developing countries, of which includes El Salvador, Central African Republic, Nigeria, Brazil, Malaysia, Philippines. The research style and methodologies adopted to successfully answer this research question is primarily quantitative methodology techniques, with the majority of the data being taken from extensive literature reviewing from various sources such as research work, reports, and academic journals.

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Enhancing Student Retention in Higher Education: A WordPress Website Development Approach

TL252 – 2

by Kieron Dalton

This project aims to develop a WordPress website to improve student retention in college courses. The website will promote altruistic, extrinsic, and intrinsic motivation, and utilize the goal setting theory, achievement theory, expectancy value theory, Atkinsons theory, Weiners attributional theory, and colour psychology. The website will offer engaging content, personalized goal setting, self-assessment tools, confidence-building resources, and positive colours. By providing students with the necessary support and motivation, the website can foster a culture of learning and growth, and ultimately improve student retention in college courses. All of these aspects will be covered by the functionality across the website. This functionality contains a to-do list page that allows users create specific and measure goals. A learning & Q&A section allows users to interact with engaging content. A quiz section acts as both a self assessment tool and a confidence building resource. Finally, the whole website will be designed with a colour scheme specifically catered towards positivity and motivation.

Technologies:

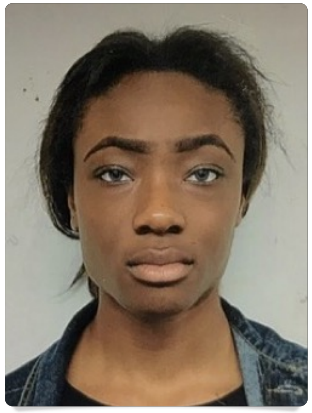
WordPress, cPanel, Inkscape, Figma, HTML, CSS, JavaScript, Hosting Ireland

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

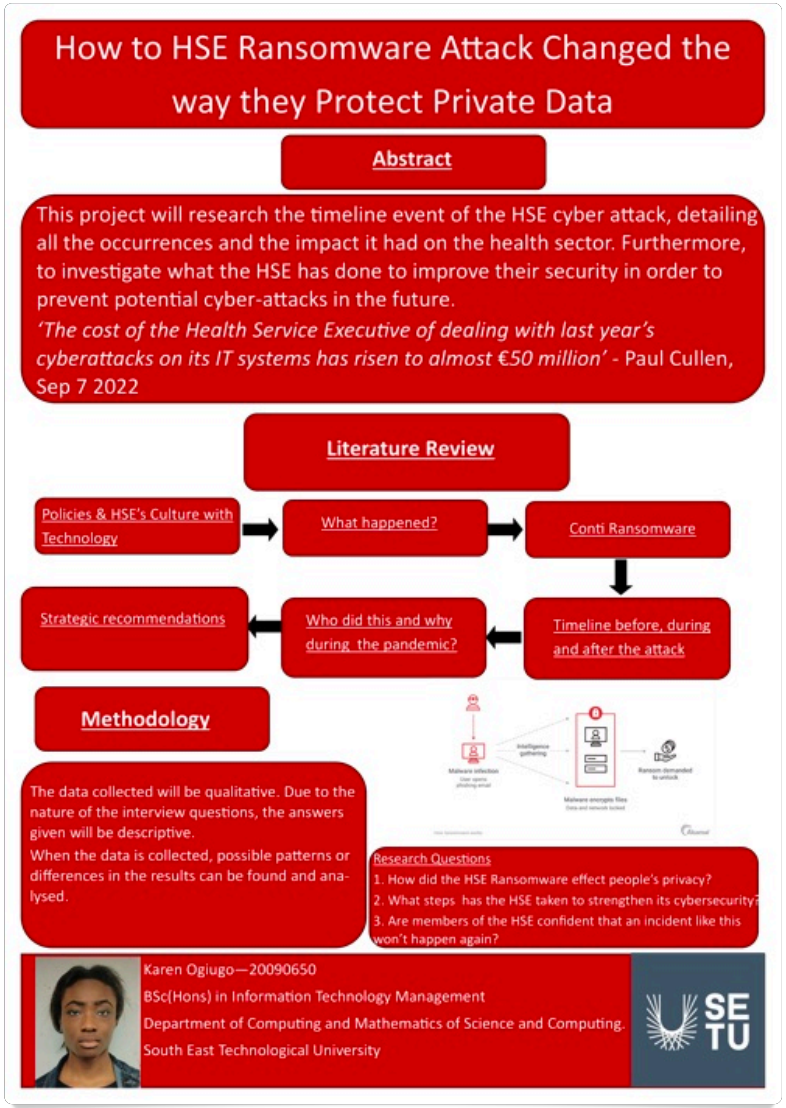
How the HSE Cyber Attack Changed the Way They Protect Private Data

TL252 – 3

by Karen Ogiugo



This project dives into everything that happened to the HSE during the ransomware attack in 2021. The Health Service Executive (HSE) is responsible for delivering health and social care services in Ireland. The purpose of this project is to discover how hackers effected approximately 130,000 workers of the HSE, their patients and clients. Healthcare services in Ireland faced disruption, immediately impacting patients who needed regular assistance, especially during the pandemic. This project documents the timeline, in detail of what exactly happened on each date as this was not a one day incident. It was an ongoing attack that lasted months. When the hacker successfully gained unauthorised access to the HSEs, they continued to operate for a duration of eight weeks. These two months consisted of abusing and disrupting as many accounts as possible. During this time, servers were compromised and data was exfiltrated. The timeline will include how things were before the attack, during the attack and after the attack. Stolen information became encrypted, yet not all information could be retrieved back. Furthermore, I will investigate how this actually impacted staff in different ways.



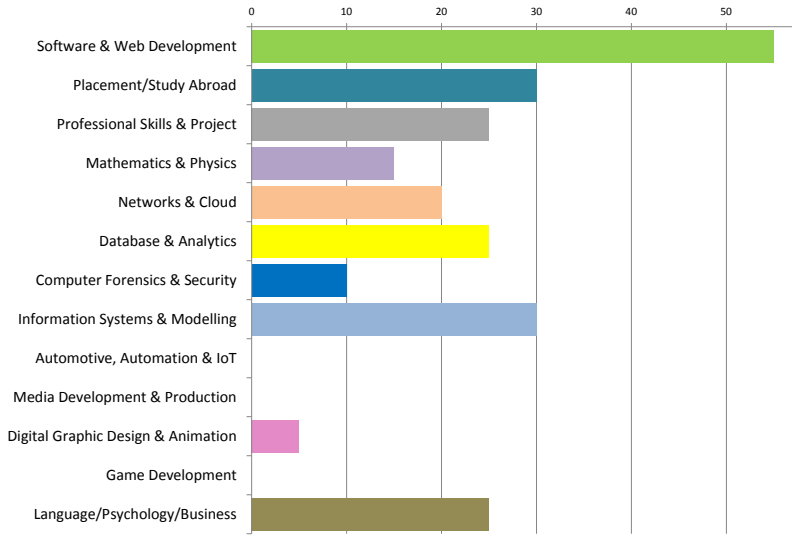
Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

The **BSc (Hons) in Software Systems Development** is a four–year Level 8 programme. Many students transfer to the final year of the programme having completed the Level 7 **BSc in Software Systems Development**.

The aim of the BSc (Hons) in Software Systems Development is

to produce a well-rounded software developer who can develop secure software with the most modern methods of software technology for all areas of application, and to analyse, select, and utilise appropriate emerging technologies for the development of a software solution in an organization context. It also addresses the ICT national skills shortages by providing graduates with the necessary skills to work effectively in a variety of software development roles, particularly in multi-disciplinary or intercultural contexts.

The breakdown of course credits across the four years on these programmes is illustrated by the following chart.

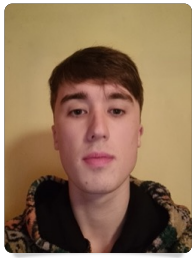


Projects


Adrian Bernacki

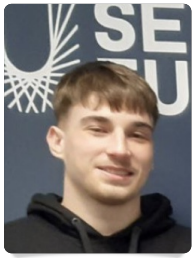

Mark Campbell


Ben Capper


Evan Casey


Robert Fox


Caoilin Kavanagh



Daniel Marko


Rebecca Troy

Anti-Spam: Mobile Real-Time Fraud Prevention Shield for Android

TL252 – 4

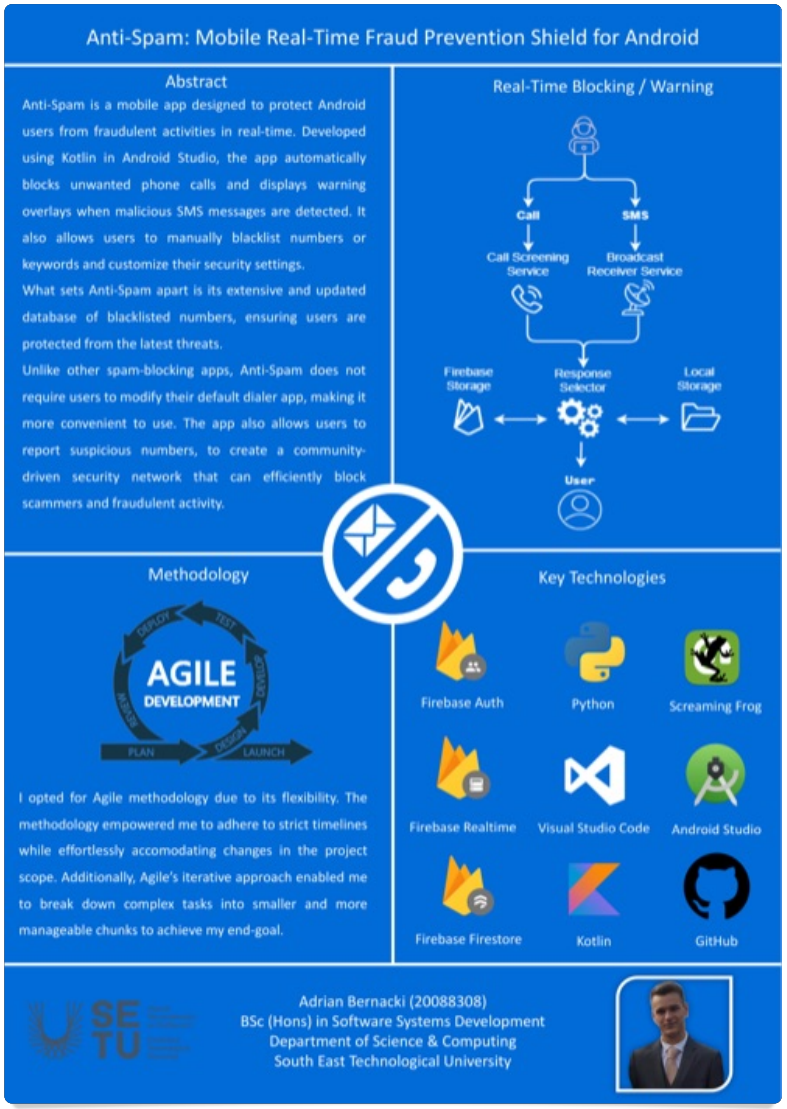
by Adrian Bernacki

Anti-Spam is a mobile app designed to protect Android users from fraudulent activities in real-time. Developed using Kotlin in Android Studio, the app automatically blocks unwanted phone calls and displays warning overlays when malicious SMS messages are detected. It also allows users to manually blacklist numbers or keywords and customize their security settings. What sets Anti-Spam apart is its extensive and updated database of blacklisted numbers, ensuring users are protected from the latest threats. Unlike other spam-blocking apps, Anti-Spam does not require users to modify their default dialer app, making it more convenient to use. The app also allows users to report suspicious numbers to create a community-driven security network that can efficiently block scammers and fraudulent activity.

Technologies:

Android Studio, Screaming Frog, Kotlin, Java, Python

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



Automated IOT Plant Watering System

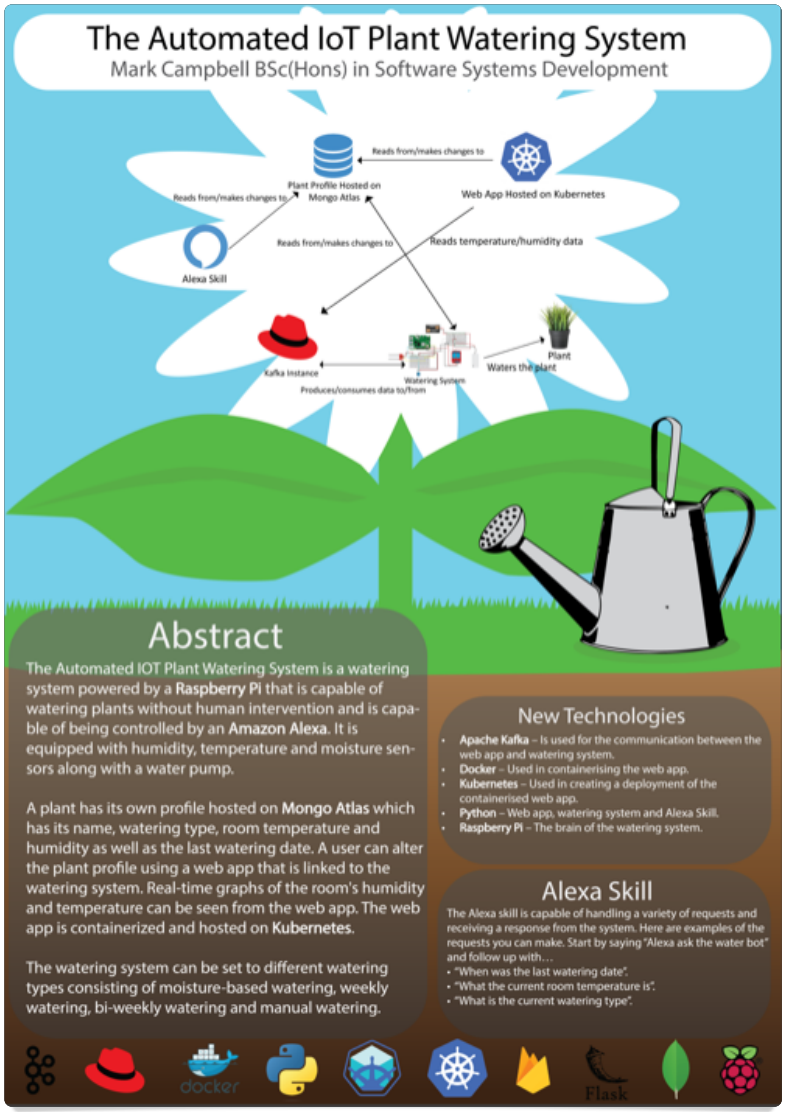
TL252 – 5

by Mark Campbell

The Automated IOT Plant Watering System is a watering system powered by a Raspberry Pi that is capable of watering plants without human intervention and is capable of being controlled by an Amazon Alexa. It is equipped with humidity, temperature and moisture sensors along with a submersible water pump. A plant has its own profile hosted on Mongo Atlas which has its name, watering type and last watering date. A user can alter the plant profile using a web app that is linked to the watering system. Real-time graphs of the rooms humidity and temperature can be seen from the web app. The web app is containerized and hosted on Kubernetes. The watering system can be set to different watering types consisting of moisture-based watering, weekly watering, bi-weekly watering and manual watering. Using the watering system Alexa skill a user can ask it questions like "When did the plant get watered last" or "Change the watering type to weekly".

Technologies:

Raspberry Pi, Python, Kubernetes, Docker, Mongo, Apache Kafka, HTML



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Android and React News Aggregation Applications

TL252 – 6

by Ben Capper

This project presents a news aggregator Android app and a React web-based app, both of which provide an in-depth overview of Western news from a diverse range of political viewpoints. Firebase serves as the backend, offering a range of services such as authentication, analytics, storage, and a real-time database, while python scripts ensure the news is constantly updated as they are run hourly on a Raspberry Pi. The applications offer a range of features: Users can save articles to access later, share articles, view a history of articles they have read, and filter articles based on political leaning. The "Leans Left" and "Leans Right" features allow users to see news sources that align with their political views and the "See Both Sides" feature offers a unique perspective by presenting two articles on the same topic from opposing political viewpoints.

Technologies:

Android Studio, Kotlin React, JavaScript, Python, Firebase, Raspberry Pi

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Community Driven Progressive Gaming Web Application

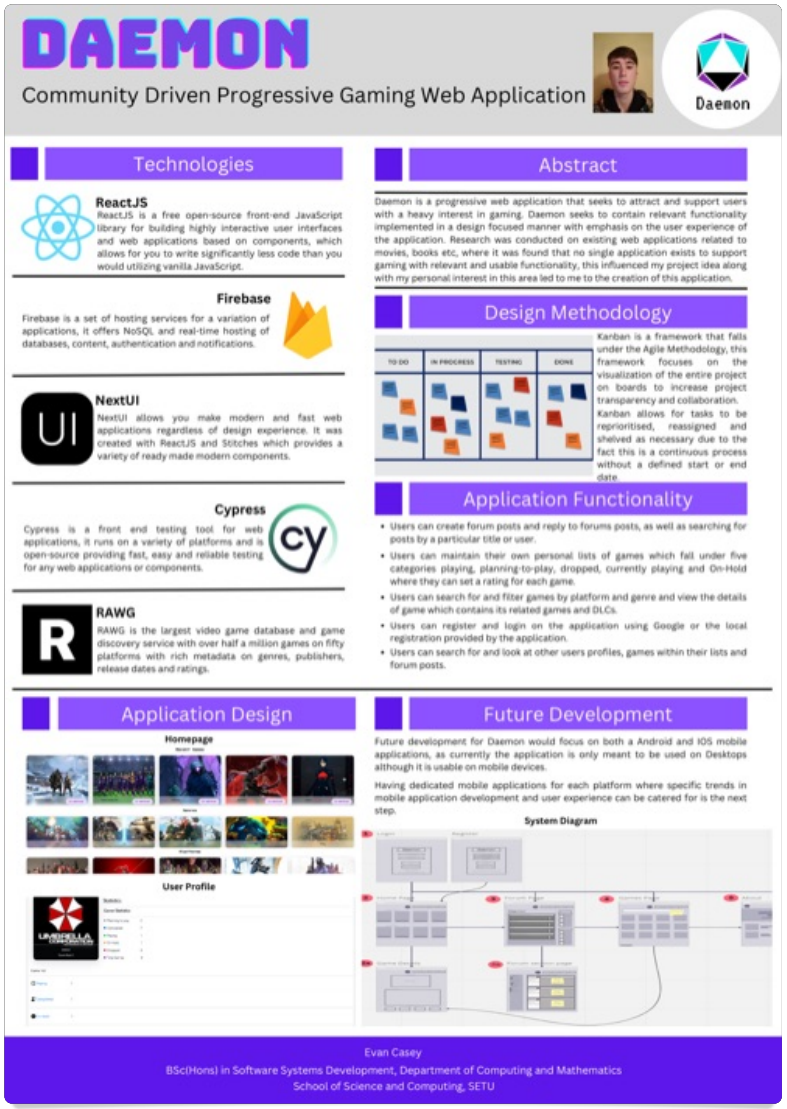
TL252 – 7

by Evan Casey

Daemon is a progressive web application that seeks to attract and support users with a heavy interest in gaming. Daemon seeks to contain relevant functionality implemented in a design focused manner with emphasis on the user experience of the application. Research was conducted on existing web applications related to movies, books etc., where it was found that no single application exists to support gaming with relevant and usable functionality. This application provides functionality related to gaming through use of the RAWG API to retrieve game data, functionality includes personal game lists, searching, filtering, pagination, user support with Firebase and a forum to allow for community collaboration. Current trends in UI/UX such as accessible and motion design, modern minimalism, responsiveness, micro interactions and the hover effect were implemented to create a modern application.

Technologies:

ReactJS, Firebase, Cypress, NextUI, RAWG API, JavaScript, ReactQuery, Mocha



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A Mobile App for Facilitating Direct-to-Consumer Sales of Local Produce: Supporting Sustainable Agriculture in Ireland

TL252 – 8

by Robert Fox

The proposed project aims to develop a user-friendly app that connects consumers with local food producers and facilitates the purchase of fresh produce directly from the source. The project seeks to capitalize on the increasing popularity of farmer's markets in Ireland, where people are eager to reconnect with locally sourced food, and there is a growing demand for sustainable food options. The app will function as an extension of a farmers market stall, allowing users to browse and select from a range of food products, view details such as price and harvest date, and make a request to producers. The target audience for the app includes food connoisseurs, health professionals, and individuals seeking higher-quality food options. The project also aims to support small-scale businesses and help farmers establish a more personal connection with their customers. While there are existing organizations operating in the same space, the proposed project aims to provide a unique and convenient user experience through a simple and intuitive interface.

Technologies:

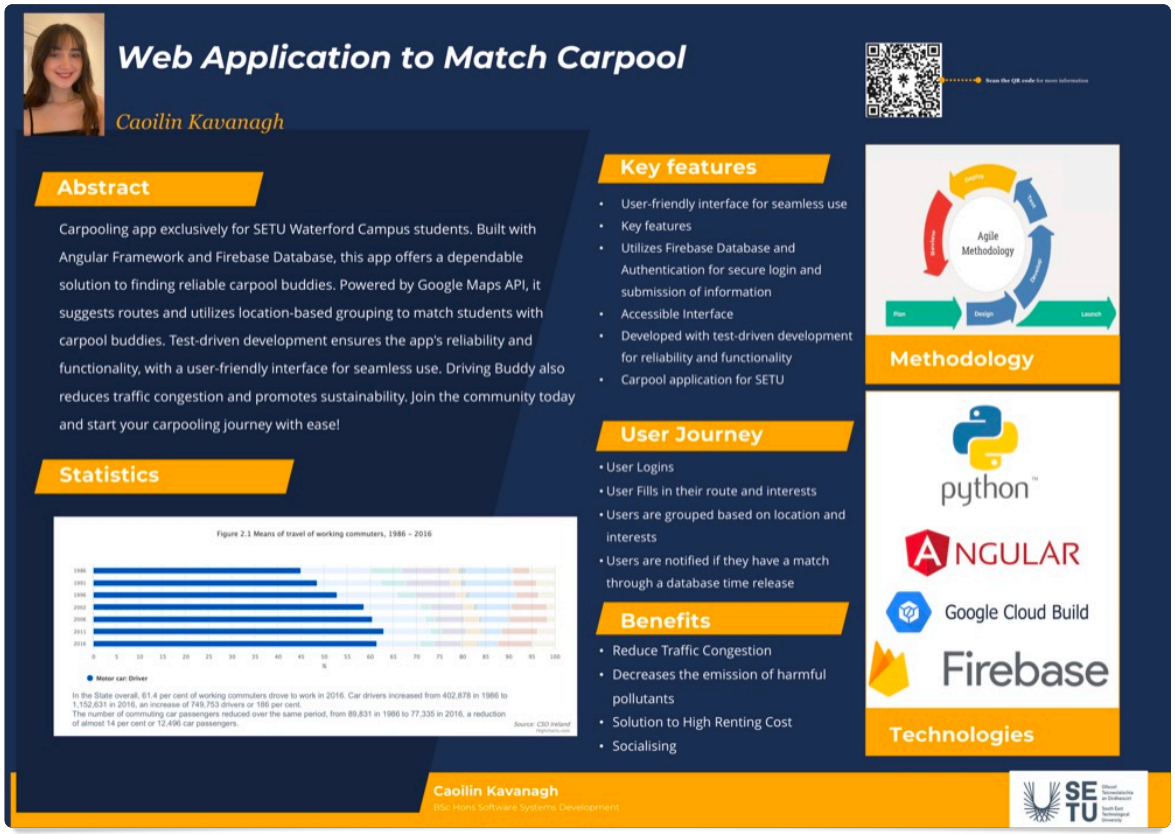
Java/Kotlin, Firebase Auth/Storage Real-time Database, Git, Canva, Trello

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Angular and Python Based Carpool Student Matching System

by Caoilin Kavanagh

Driving Buddy is an application designed specifically for students of SETU Waterford Campus. It helps students find carpool buddies with whom they share common interests while prioritising location. Built using Angular Framework in Typescript. Angular is a component-based architecture that facilitates reusability and maintainability. Firebase Database and Authentication in the application allow students to log in and submit a form that includes their personal information, home address, and interests. They are then presented with suggested routes to their destination using Google Maps API, and they can choose their preferred route. The application stores this information and uses location-based grouping to match students with carpool buddies within a set radius chosen by the student of their route. This method uses Google Cloud Build with Python to complete and initiates a time-based release. Test-driven development was essential to the development process. Testing each feature before development ensured the applications reliability and functionality. The app also helps reduce traffic congestion, easing the stress of housing shortages and promoting sustainability in the community.



Technologies:

Angular, Firebase, Cloud Build, Node Js, GitHub, Python, Typescript

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Career Progressive Web Application

TL252 – 10

by Daniel Marko

The website is a platform for students to apply for internships and access resources to prepare for the application process. It offers tools to help students build their resumes and provides tips and guidance on how to succeed in interviews. Through this website, students can easily search and apply for internships that align with their career goals and interests. The site also provides a range of resources to help students succeed in the competitive internship market, including information on how to stand out in their applications and how to effectively communicate their qualifications and experiences. Overall, the website serves as a valuable resource for students looking to gain valuable work experience and build their professional skills through internships. The web application also has its own configured REST API, and data is stored using a MongoDB.

Technologies:

ReactJS, JavaScript, MongoDB, TypeScript, Axios, Redux, CSS, MongoDB

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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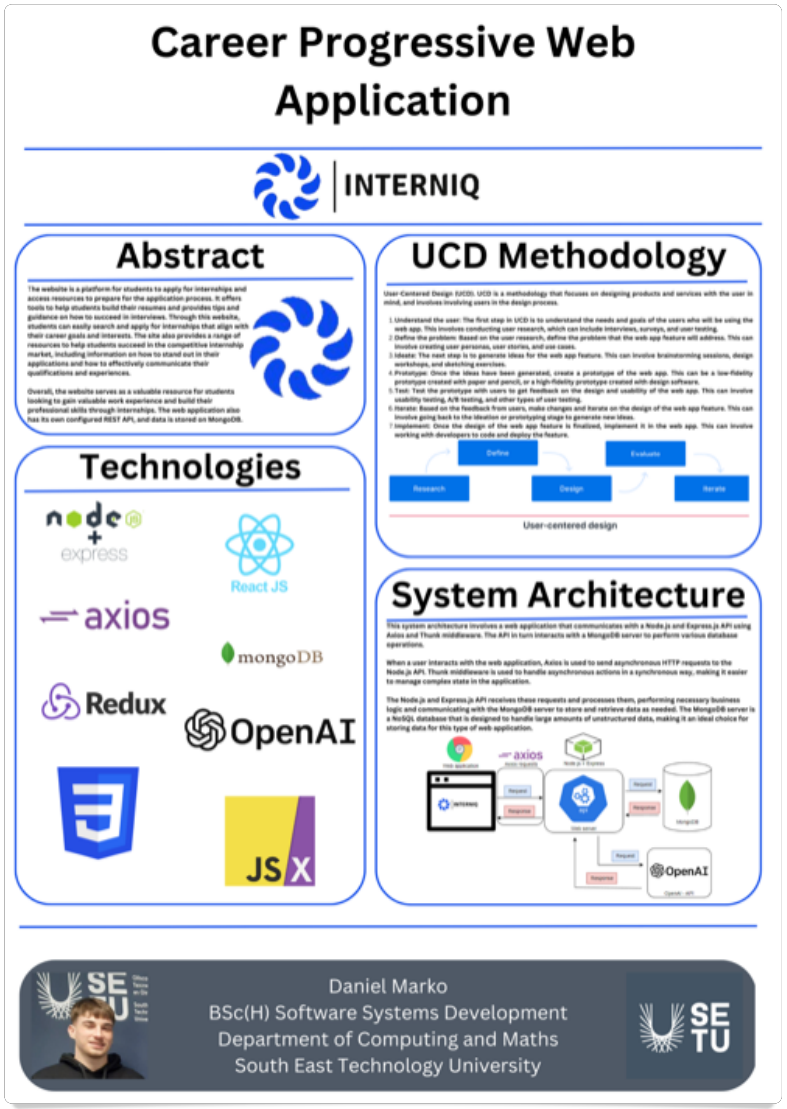
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



SETUSU Vote: A Secure E-Vote Management System with Facial Recognition

TL252 – 11

by Rebecca Troy

This project aims to design and implement a secure e-vote management system, targeted specifically towards SETU's Student Union. The web application will streamline the voting process by handling voter registration, candidate promotion, voting, and counting of the votes. The system emphasises voter privacy and security throughout and offers an advanced authentication mechanism that requires users to upload a valid photo of their student ID card upon registration and undergo facial recognition before casting their vote to ensure the person attempting to vote matches the registered student. This system also offers more freedom to candidates, who can manage their public profiles and campaigns conveniently. The application is designed for three types of users: admins, candidates, and voters, each with specific functionalities. The primary goal is to eliminate manual counting and minimise human error, making the process efficient, accurate, and secure. The proposed e-vote management system will revolutionise the traditional voting process at SETU with its advanced security features.

Technologies:

Node.js, Express JS, MySQL, AWS Rekognition SDK

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

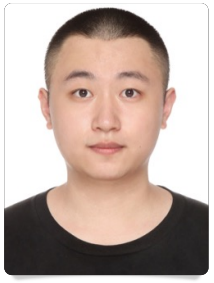
BSc (Hons) in Software Systems Practice (NUIST)

The aim of the BSc (Hons) in Software Systems Practice (NUIST) is

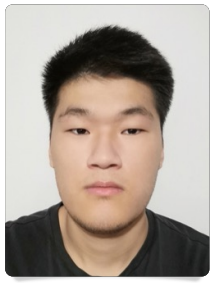
to provide overarching and theoretical frameworks so that graduates will have knowledge of advanced concepts in software development methodologies and disciplines. They will be able to select appropriate paths in designing complex software or in developing computer-based systems. As individuals, they will work effectively independently, but will also experience team work, with the challenges and benefits this can offer. At the heart of the programme is an emphasis on practical development of computing skills, underpinned by a strong theoretical reasoning.

The programme aims to provide an opportunity for students who pursue three years successful education on the NUIST BSc in Software Engineering, the opportunity to complete their fourth year of education in a dedicated one-year add-on degree in SETU (Waterford). On successful completion of this fourth year in SETU, the student would be awarded a BSc (Honours) in Software Systems Practice from SETU as well as a BSc in Software Engineering from NUIST.

Projects

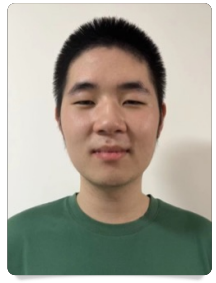

Kaiyu Chen

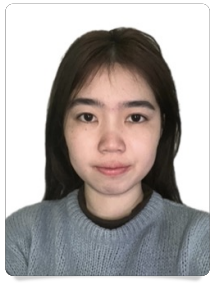

Shu Chen

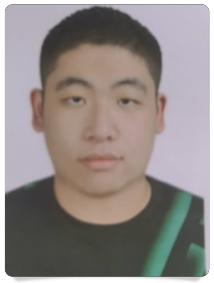

Yikun Fan


Ling Feng


Guanlan Ji


Yuanhao Luo


Yifei Ma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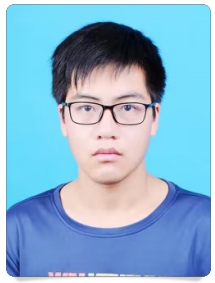
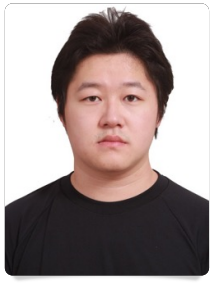

Shunyi Xu

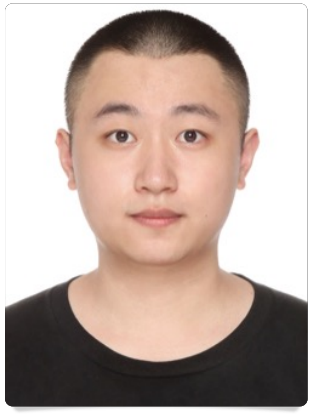

Luo Yang


Zihan Zhang

Full Stack Food Delivery Platform

(Not Presenting)

by Kaiyu Chen



FooDelivery (FD) is a web-based food delivery platform that leverages the most up-to-date technologies, including NestJS, GraphQL, WebSockets, Typescript, and React, to provide a sophisticated developer experience and engaging user experience. Similar to popular food delivery platforms like Just Eat and Deliveroo, FD caters to multiple user types, including customers, owners, and couriers, each with a personalized dashboard displaying content tailored to their specific needs. For example, customers can easily place a food order, make payments, and receive notification of its status. On the other hand, owners can manage their food orders, analyze sales data, and make informed decisions based on the data analysis tools provided by FD. Additionally, FD integrates with Paddle for secure online payment processing and Mailgun for efficient email communication, offering users convenient payment and communication options. To enhance the delivery experience, FD allows customers to view the planned delivery route on Google Maps and receive updates on its status. With its advanced technology and user-friendly features, FD aims to provide a seamless and efficient food delivery experience.

Technologies:

TypeScript, Node.js, React, GraphQL, Tailwind CSS, Nest.JS, TypeORM, PostgreSQL

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A 2D Platform-adventure Metroidvania Game on Windows Computers

(Not Presenting)

by Shu Chen

This game is a 2d platform-adventure Metroidvania game on windows computers and is played with a keyboard and mouse by a single player. The player will operate a black elf to take adventures in the dark forest to save the forest and bring the light back to it. Players need to defeat the enemies, defuse the pollution of the forest, and escape the chase of the boss. The enemies will appear in a fixed range and attack the player when the player is close to them. As the game goes on, players can collect props to restore health point (HP) and magic point (MP), increase MAX HP and MP, and acquire new skills, such as energy saving jump, ground smashing, rebound jump and three-level jump. When the game enters a specific level, players need to escape from the level killing mechanism. Players can gain experience by killing monsters or acquiring ability items. When the experience reaches a certain amount, they can gain skill points. Players can purchase skills through skill points. The game is developed based on Unity Engine and C # programming language.

Technologies:

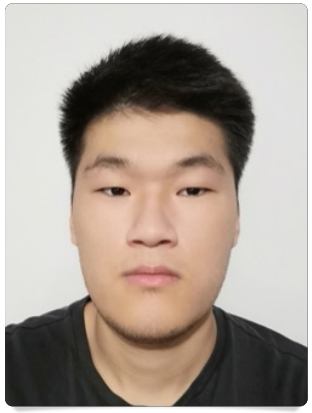
C#, Unity Engine

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Store Operation Auxiliary System

(Not Presenting)

by Yikun Fan



The system will be a management auxiliary system for small-scale retail store owners to manage store operations. Using this system, store owners can manage some operations of offline physical stores and master some data on store operations. Store owners can also manage their online business. Therefore, the system will also implement an online ordering platform for customers to use. The technology used in this system is one of the most popular technologies currently: spring + vue + mysql. The system is developed in an agile development manner. The development stage will be roughly divided into five sprints. It is expected that the implementation of the background management system will be completed in the first three sprints. The implementation of the online shopping system for customers is going to be completed in the fourth sprint, and the addition of some additional functions or the reconstruction of existing functions is going to be completed in the last sprint.

Technologies:

Vue.js, Springboot, Hibernate, MySQL

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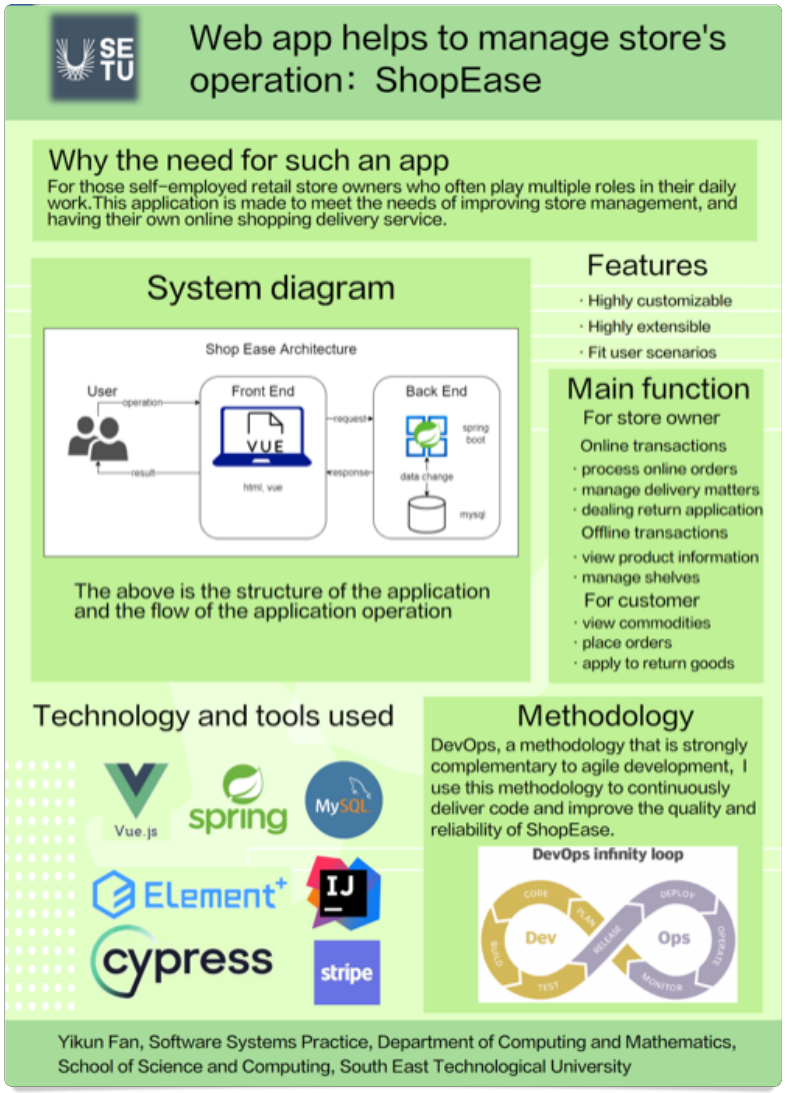


Adaptive Wireless Sensor Network Energy Monitoring Platform

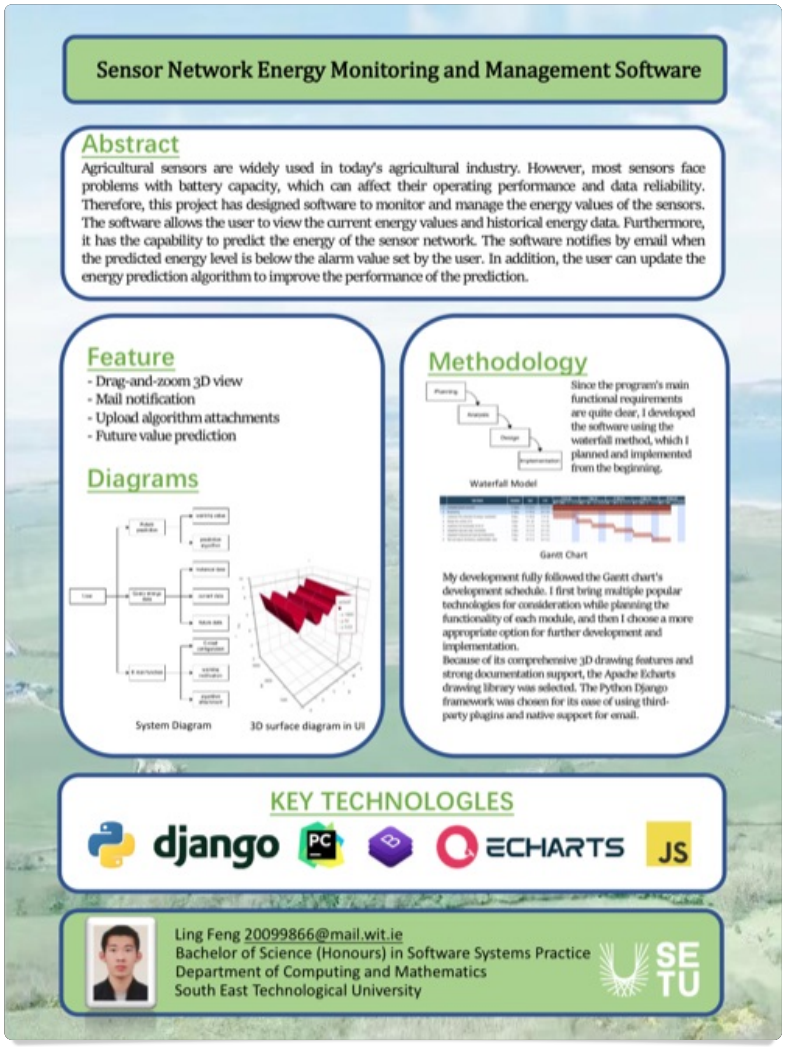
(Not Presenting)

by Ling Feng

This final year project is about the development of a sensor energy display platform that utilizes JS-based 3D surface diagram display libraries and Python Django-based back-end framework technology. The platform provides current and past energy displays, future energy predictions, warning value settings, and an alarm system for sensors below the warning value. These features allow for efficient and effective energy management and help to promote sustainable energy usage. The platforms capabilities can be utilized in various settings. It enables users to identify and predict future energy demands. The alarm system alerts users to sensor readings below the warning value and through Email, enabling proactive maintenance and reducing the risk of equipment failures. Overall, this sensor energy display platform offers a comprehensive solution for energy monitoring and management. Its potential for scalability and customization make it a valuable tool for promoting sustainable energy usage and contributing to a more efficient energy culture.

Technologies:

JS, Python



Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
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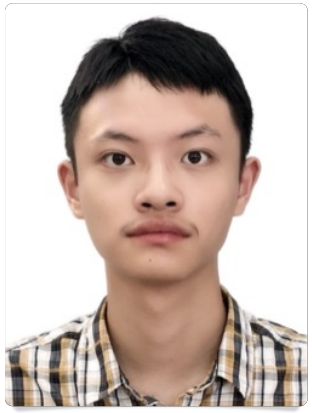
Ranking and Review Web Application

(Not Presenting)

by Guanlan Ji

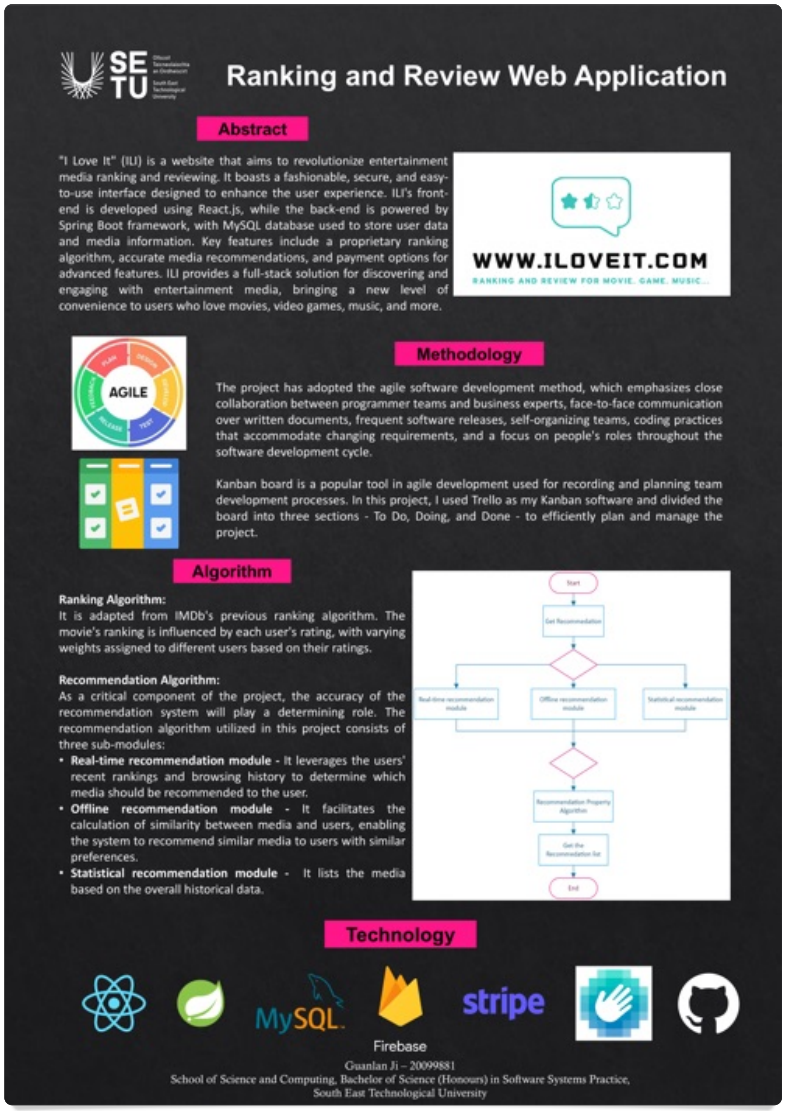


This project aims to bring a new level of convenience and sophistication to the world of entertainment media ranking and reviewing. The website, called "I Love It" (ILI), is designed to be fashionable, secure, easy-to-use, and packed with features to enhance the user experience. The front-end of ILI is developed using React.js, a leading technology in web development, while the back-end is powered by Spring Boot framework. MySQL database is used to store user data and media information. ILI user-friendly interface makes it accessible to people of all ages and technical backgrounds. It offers several key features, including the ability to rate and rank media using a proprietary ranking algorithm, accurate media recommendations through a recommendation algorithm, and payment options for advanced features. In summary, this project represents a full-stack solution to the problem of discovering and engaging with entertainment media. It is designed to bring a new level of convenience to users who love movies, video games, music, and more.

Technologies:

Java, JavaScript, MySQL, Spring Boot, React.js, node.js

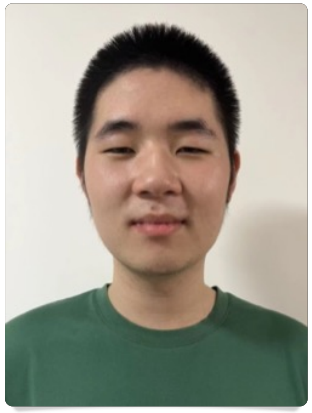
Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



A Media Website with Simple Deployment

(Not Presenting)

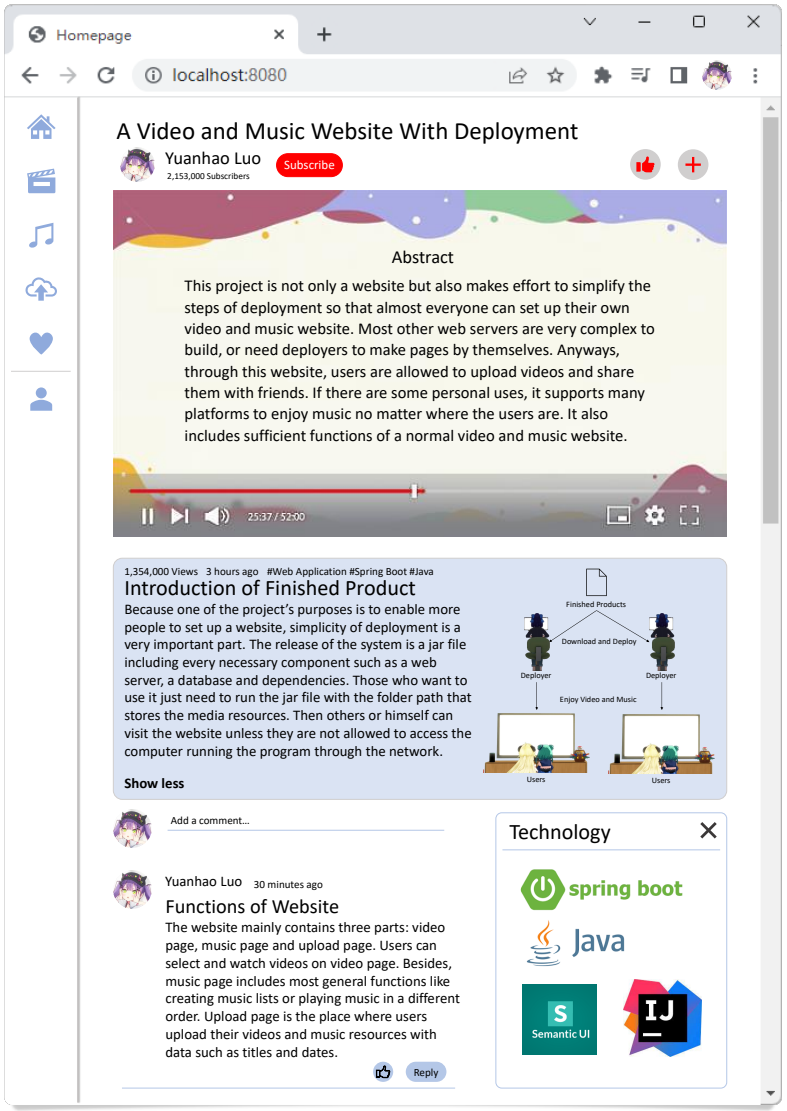
by Yuanhao Luo



It is a website deployment method to build a website in several simple phrases. The website is to share and watch media resources like video or music. If someone want to setup the website, he needs to download some files, and deploy on the web server with some simple instructions. Then, he can share the URL to his friends. Every user can upload videos and watch all of the videos on the website. With this website there is one person required to build the website and when you want to recommend a video, you just need to upload it. Others are unnecessary to download the video again, they can watch it directly on the website. The files in the final version can be divided into two parts: main program and media resources. Main program are the codes to execute the whole system including back-end, front-end and the connection to other parts. Database is also a part of main program. The function of the database is to store the information like username, video title and so on. Media resources are the place required for storing all of the video and music.

Technologies:

Java, Spring Boot, Thymeleaf, MySQL

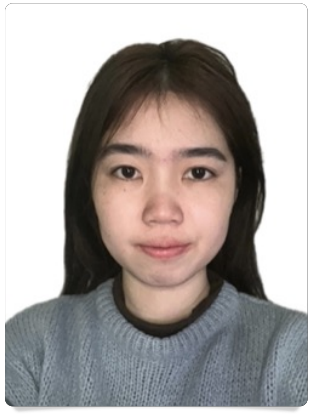


Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

UUget: SpringBoot-based Web Application for Second-hand Trading on Campus

(Not Presenting)

by Yifei Ma



This project aims to provide a campus second-hand trading platform for students at SETU, using Vue,SpringBoot,and MySQL as the main development tools for front-end, back-end, and database. The background of this project is that international students need to buy a large number of daily necessities during their studies, but it is difficult to find the second-hand goods they need due to lack of information channels and resource wasting. Therefore, this project aims to provide a convenient second-hand trading platform for students, to improve the utilization efficiency of campus resources. Through this platform, users can view personal information, publish and browse second-hand goods, communicate with sellers or buyers, etc. Compared to traditional second-hand trading platforms, this project adds image recognition functionality to help users quickly find the items they want. The goal of this project is to solve the existing problems and deficiencies of second-hand trading platforms, improve user experience and efficiency, and ultimately achieve the rational use of campus resources.

Technologies:

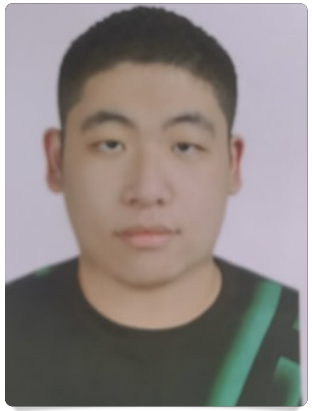
Vue.js, JavaScript, Java, MYSQL, JPA

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Water and Electricity Management System

(Not Presenting)

by Chenghao Xie



Water and electricity management system is an information management system, and its development mainly includes front-end web applications and back-end databases. The water and electricity management system is designed to solve the problem of difficulty in collecting water and electricity bills. There are many dormitory buildings in the school. I hope to develop a convenient information system for managing water and electricity charges in student dormitories to facilitate dormitory managers systematic management of the school dormitories. In this system, first, you can authenticate in the login interface, administrators can add, delete, and modify information (including administrator information, user information, water bill information, electricity bill information) in the database, there are also management functions such as data backup, account preservation and data export, and relevant users can query the usage information and make payments. All in all, this system can reduce the pressure on pertinent staff and users, allowing users to understand and pay water and electricity bills, making our lives more convenient and making dormitory management more orderly and efficient.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A 2D Ruguelike Game in Pixel Style

TL252 – 12

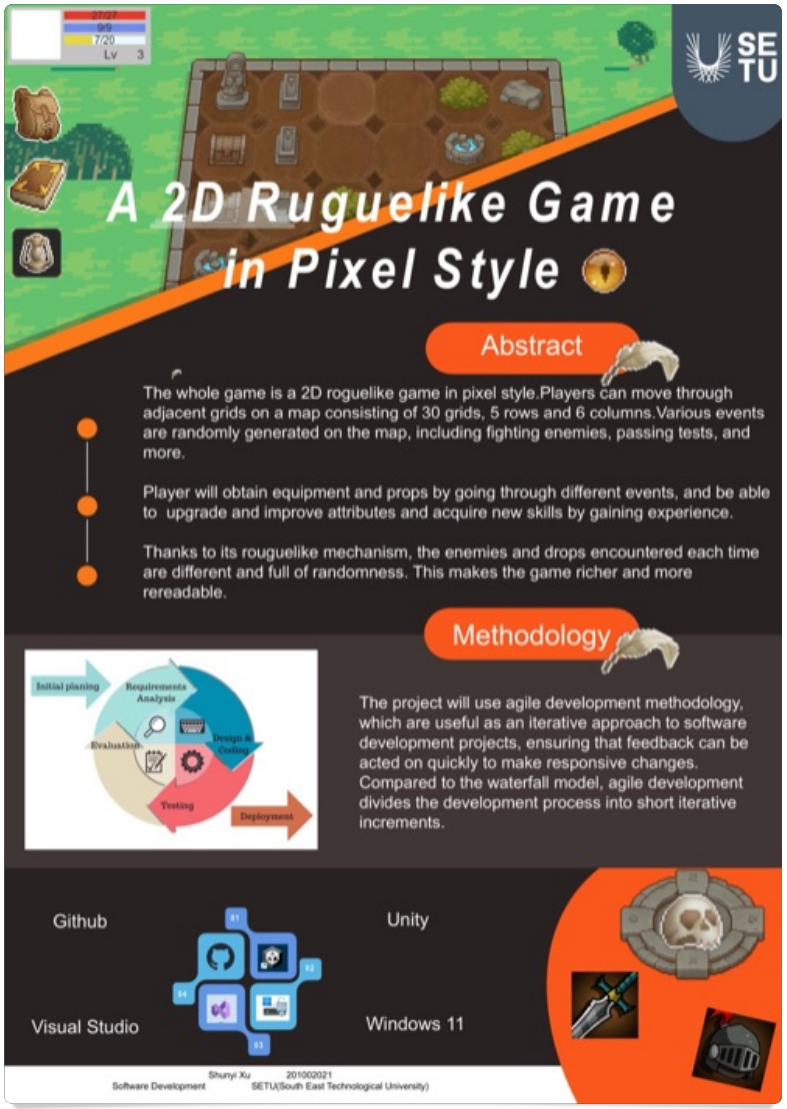
by Shunyi Xu

My project is a 2D game and the main picture materials are all in pixel style, with the roguelike type is adopted in the game mechanism. Roguelike is a general term for a game that follows the gameplay of the 1980s game Rogue, developed by two software engineers, Michael Toy and Glenn Wichman, on the UNIX system and running on the mainframe. The original purpose of the game is to reproduce the "DND" game experience on the computer, and strictly follow the "DND" game rules of the single turn role-playing game. The features with high frequency of Roguelike include: 1. Generate randomness. Every new start will randomly generate game scenes, enemies, treasures and other different things. Every adventure of the player will be unique and cannot be copied. This greatly improves the replayability of the game. 2. Non-linear. Rigorous yet flexible game rules give Roguelike a very high degree of freedom. In the game, players can use their imagination to solve problems encountered in the game through different methods and combinations of props. 3. System complexity. Roguelike games may include an incalculable number of elements in one game, and in some games may include hundreds

Technologies:

C#

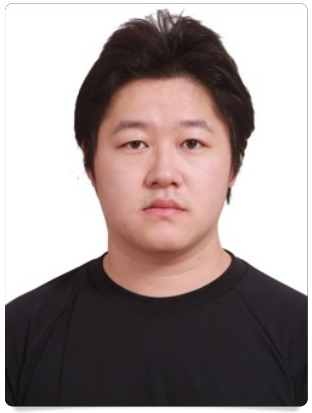
Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End



Unity Top-down Roguelike Bullet Hell Shooter Game

(Not Presenting)

by Luo Yang



Infinite Dungeoner is a top-down bullet hell shooter game with roguelike elements, developed based on the Unity engine. Players can control one of several characters, general, thief, scientist, etc., who will explore in this dungeon full of terrifying monsters. Those who reach the bottom of the dungeon and get the highest score will be recorded on the leaderboard. In the game, players can shoot, overturn tables or dodge rolling to avoid bullets, and obtain supplies and more powerful weapons from the chests generated in the dungeon. The dungeon is made up of multiple levels, each having many randomly generated rooms. The layout and rewards are procedurally generated from a number of pre-created rooms. In order to defeat the monsters, the player must use a wide variety of guns or even staffs. Each level ends with a random boss that must be slain to advance to the next floor. However, reaching the bottom is not the only goal. You are not the only one who reaches the deepest area of the dungeon, but can you be the one with the most scores? In addition, the game contains a variety of weapons, it is possible that your next round will get more powerful and more interesting guns!

Technologies:

C#, Unity Engine, Git, Visual Studio

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

SpringCloud-Based Digital Currency Exchange Platform

(Not Presenting)

by Zihan Zhang

Digital currencies such as Bitcoin and Ethereum are currently trending around the world, and an increasing number of people are investing in them. These users require a reliable trading platform that is easy to use and provides detailed analysis. CoinHub, my final year project, is a digital currency exchange platform based on SpringCloud. Its frontend will be developed using React.js, and its business services will primarily be implemented in Java. Python will also be used to enforce certain machine-learning functions. As many primary trading services as possible are provided in this project, the order-matching system is crucial for all electronic exchanges because it executes orders in each transaction. Compared to traditional order-matching systems that rely on databases, this system has a faster response time because it uses in-memory data to improve order processing speed. Another achievement of this project is providing a trading strategy using the Deep Reinforcement Learning (DRL) method. The trained AI model performs well on historical data. Based on its daily trading strategy provided, it would help users to benefit.

Technologies:

SpringCloud, React.js, Python, Redis, MongoDB, Blockchain

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics
Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things
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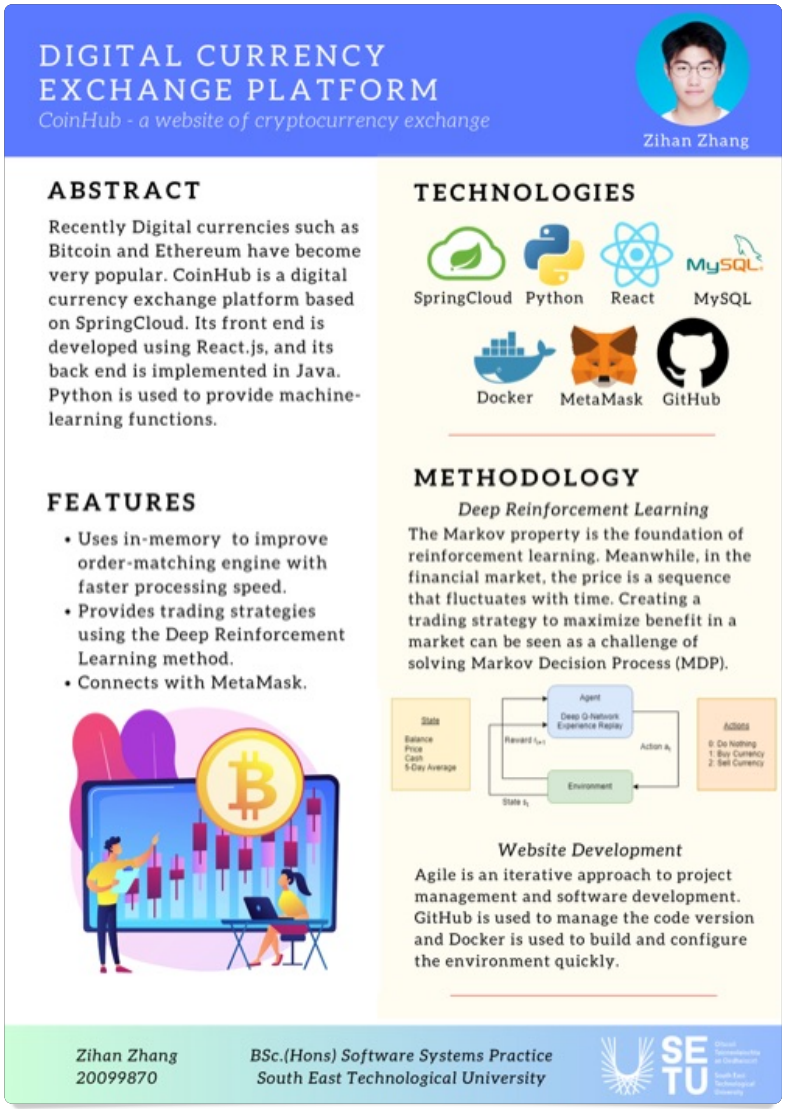
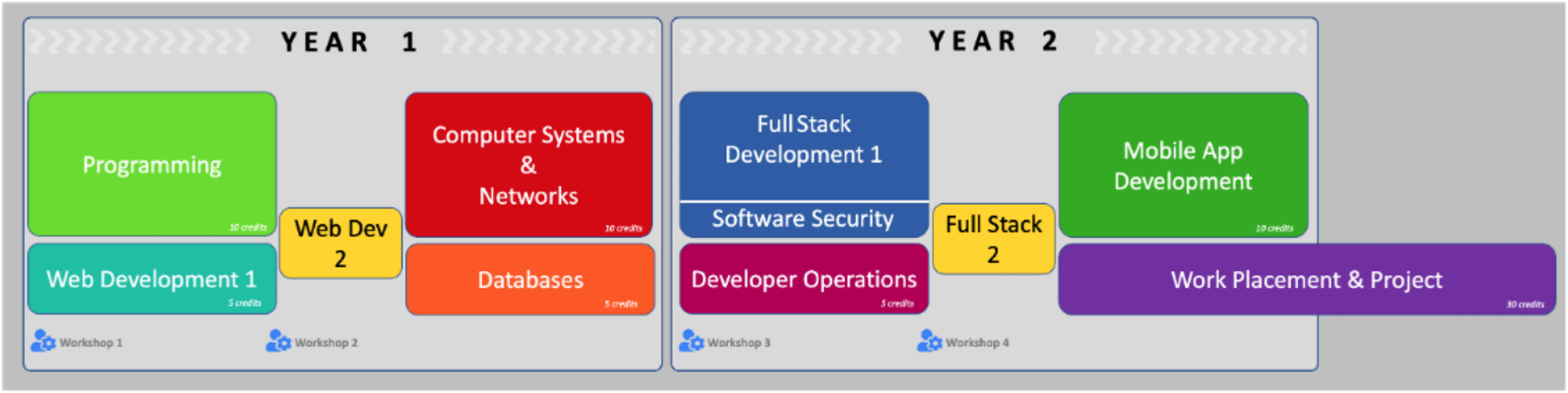


SECTION 2

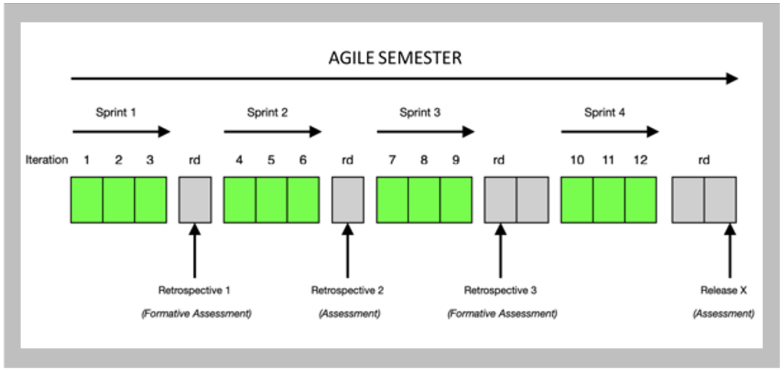
Higher Diploma in Science - HDip

Higher Diploma in Computer Science (Online)

The ONLINE **Higher Diploma in Science in Computer Science** is an accelerated 24-month ICT Conversion Course focused on full stack oriented development. It is designed to allow honours graduates from non-computing disciplines to acquire the industry-relevant ICT and software development skills, expertise and practical experience required to become suitable candidates for employment in the ICT domain in general and in software development in particular.



As an accelerated course, there is an average time commitment of 16 hours per week required. Students with less ICT experience may need to factor in more time. The course is delivered using our award-winning online delivery platform—TutorStack. Pioneered on this programme with industry, we follow an "Agile Semester" approach, typically consisting of 4, three-week sprints followed by 1-week breaks for retrospective, after each sprint.



In addition there is a six lesson on-demand module each summer. Online delivery over the two years is supplemented by four onsite workshops to further enhance and deepen the learning experience, and learning community. Although not mandatory, these should be deemed essential. While all taught modules are delivered within two years, Work Project & Placement runs into the following year so as not to over burden students.

For a more in depth preview of the course content and structure, please watch this video.

Try out a sample of the course here.

Find out more here.

Projects

Projects by Type

CI/CD (Pipeline), Testing, Ops


Owen Corrigan


Cathal Duffy


Brian Kinsella


Patrick Marnane

Hybrid/Progressive App


Andrew Cameron


Jason Grant


Fiona Waters

NDA - Workplace Project


Caroline Conway


Bozhena Demus


Declan O' Donovan


Tom Tobin

Native Android app


Conor Brennan


Nora Hackett


Dale Healy Egan


Colm O Keeffe


Níle O'Hagan


Ahmad Sabeh-Murphy

Physical computing (IOT)


Harry Kelly

Testing


Margaret McCarthy

Web App


Bernard Cattigan


Grace Doyle


David Fagan


Craig Grehan


Jordan Harrison


Sheila Kirwan


Sophia McGee


Tomas O Dalaigh


Owen O'Donnell

Workplace Project


Egle Budinaviciute


Anders Ingelsten


Claudia Marques

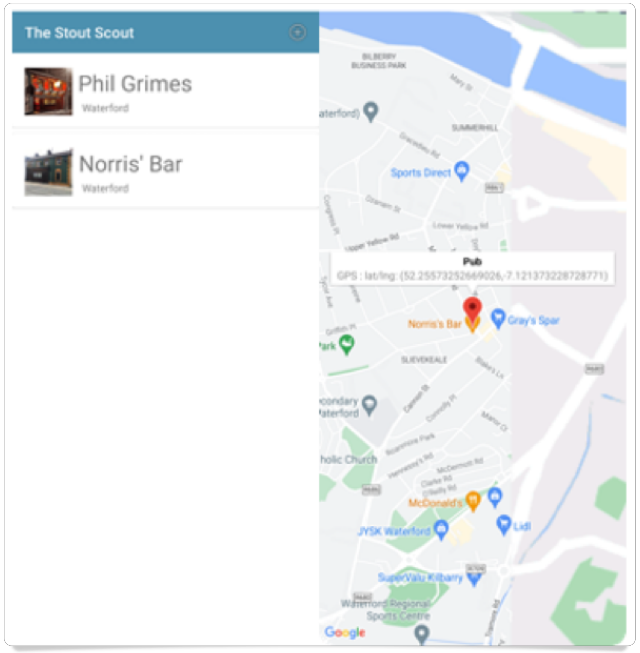
The Stout Scout

Native Android Application

LOCATION

TL238 – 71

by Conor Brennan



Originally planned to build a stout review app. However, due to unforeseen circumstances and time constraints this could not be. The Minimum Viable Product of that could only be built. A simple pub-rater app where the user can add pubs and their locations, upload an image and rate it.

Project Type: Native Android app

Technologies: Android Studio, IntelliJ IDEA, Kotlin, Java, XML

https://thestoutscout.my.canva.site/

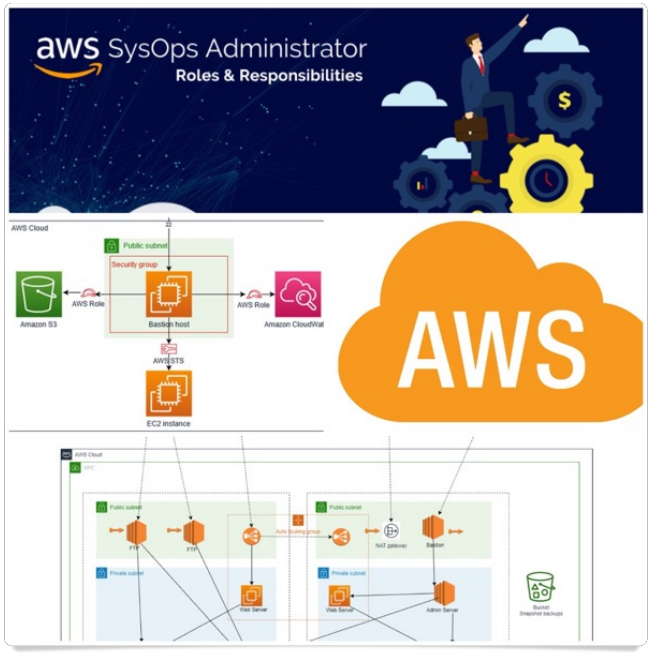
Cloud SysOps

Cloud Systems Operations (SysOps)

LOCATION

TL245 – 95

by Egle Budinaviciute



A work based project directly aligned with my work placement role. Exploring Cloud Systems Operations (SysOps) roles and responsibilities and showcasing completed tasks while performing my role as cloud engineer. I will be presenting a conference style report including: background, objectives, requirements, planning & testing, outcomes of service requests completed. In this report I expand on 5 larger service requests I've completed while performing my role. Service requests include a variety of topics within the cloud: data migration, automated patching, encryption, monitoring and security.

Project Type: Workplace Project

Technologies: Amazon Web Services (AWS), Datadog, Terraform, Azure Cloud

https://reader.tutors.dev/course/cloud-sys-ops

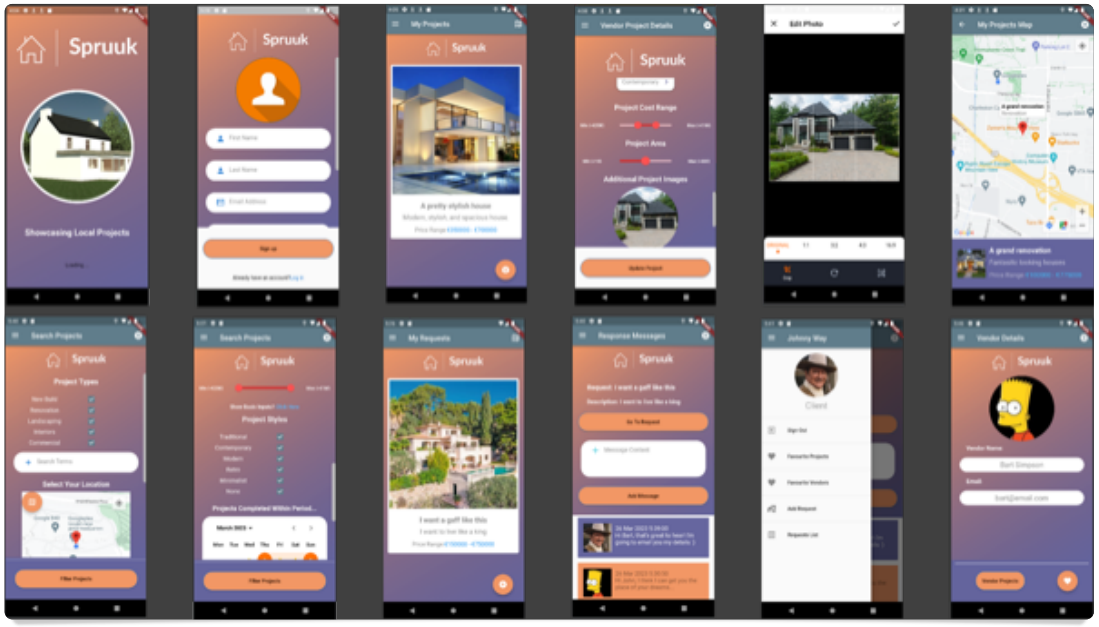
Spruuk

A mobile and web app developed on Flutter SDK for promoting local projects

LOCATION

TL238 – 75

by Andrew Cameron



Spruuk is a hybrid mobile and web application platform for companies in the construction, architecture, and landscaping industries to showcase their portfolios of work to the general public as a form of marketing. Clients are able to search existing projects based on selected criteria, or they can use maps to identify vendors behind the projects they view in real-life. Once logged in, clients can create lists of favourite projects or favourite vendors. There is also an option for clients to post requests for projects to be completed, including an inbuilt messaging capability for dialogue with vendors.

Project Type: Hybrid Mobile App

Technologies: Flutter SDK, Android Studio, Dart, Firebase, Figma, Trello

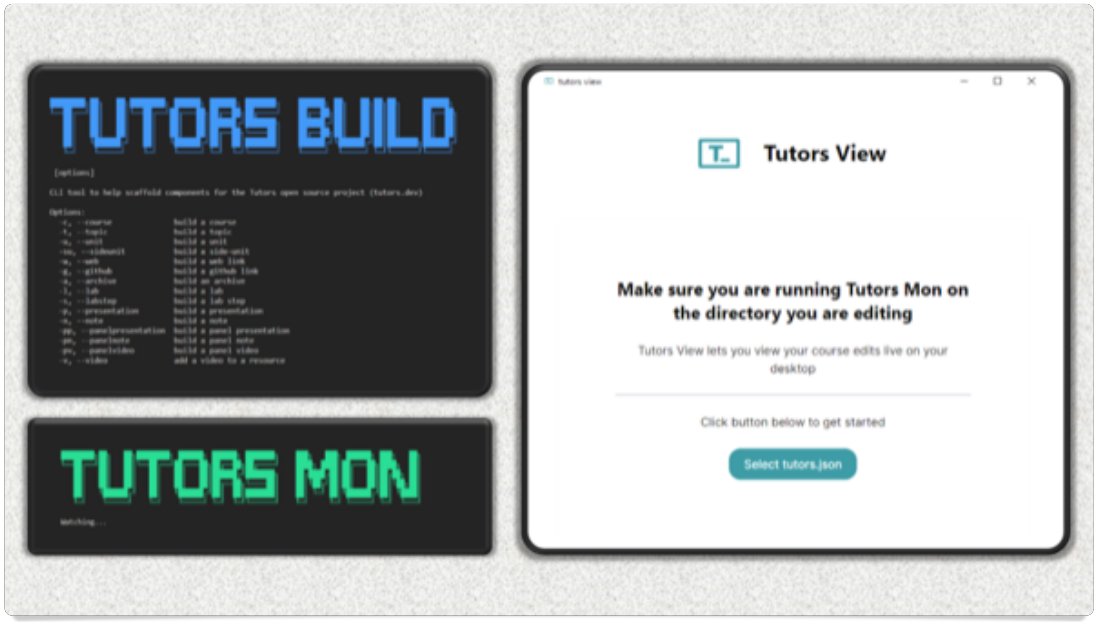
https://spruuk.glitch.me/

Tutors: The Educators Experience

LOCATION
TL235 – 82

A collection of open source components (Build, Monitor and View) to simplify course creation using the tutors platform

by Bernard Cattigan



Tutors is a collection of open-source components and services supporting the creation of transformative learning experiences. Creating courses for Tutors can be somewhat difficult and time-consuming. My project aims to simplify the course creation process and improve the overall experience for educators through the development of three applications. *Tutors_Build*: Help educators to scaffold the different components that make up a course. *Tutors_Mon*: Monitor the course folders for changes so that the course generation process runs automatically when a change is detected. *Tutors_View*: Provides a local version of the Tutors platform so educators can preview their changes before deployment.

Project Type: Web App, Open Source, CLI, Tauri Desktop Application

Technologies: Nodejs, Sveltekit, Tauri

https://bit.ly/tutors-the-educators-experience

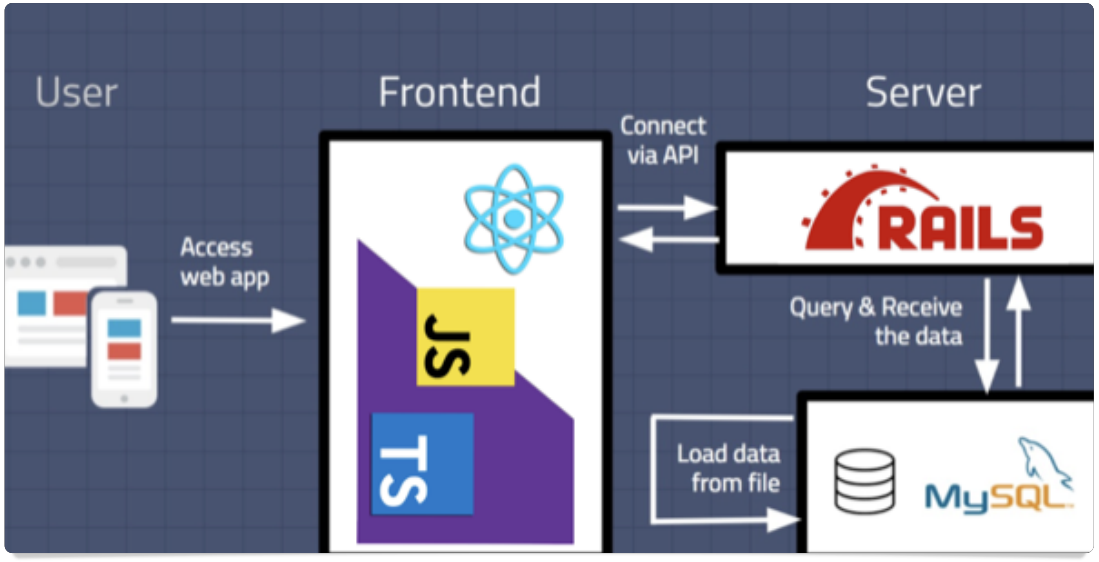
Vulnerability Show Page UX Upgrade

UX Front End Angular to React Upgrade

LOCATION

NDA – 97

by Caroline Conway



A number of projects on the HDip in Computer Science are subject to NDA. Such projects are supervised and graded as normal while honouring the term of the NDA.

Project Type: NDA, Workplace Project, Web App, UX / Front End

Technologies:

StrimziPythonClient.com

Written Python Client for Strimzi Client-Examples Repository

LOCATION

TL235 – 90

by Owen Corrigan

An ever-expanding amount of data is streamed in real-time, as modern applications need to act on up-to-the-millisecond data before the data becomes stale. Apache Kafka is a real-time event streaming system that can handle trillions of messages per day. An open-source project called Strimzi reduces complexity in creating instances of Apache Kafka in a Kubernetes cluster. This project developed a Python client for the Strimzi Client-Examples repo hosted on GitHub. A Kafka Consumer and Kafka Producer with Dependencies and Configuration files was written in the Python language to compliment the current clients.

Project Type: DevOps, Open Source, Workplace Project - Public

Technologies: Python, Java, Strimzi, Apache Kafka, Kubernetes, Minikube, Docker

https://owencorrigan76.github.io/

Subject to NDA

Project Details are Subject to NDA

LOCATION

NDA – 98

by Bozhena Demus

A number of projects on the HDip in Computer Science are subject to NDA. Such projects are supervised and graded as normal while honouring the term of the NDA.

Project Type: NDA, Workplace Project, Web App, UX / Front End

Technologies:

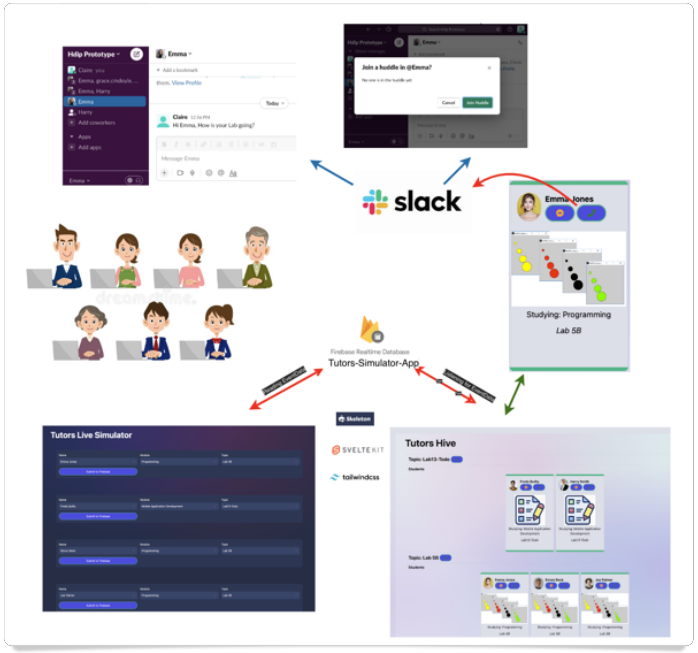
Tutors Hive

Sorting and Social for Tutors Live

LOCATION

TL235 – 84

by Grace Doyle



Tutors Hive is based around the current SETU TutorsLive software. It is a prototype of the current Tutors Live software, with two apps, one for simulation of data, which writes to Firebase Realtime database, and secondly, a front-end prototype" (Tutors Hive) app, which builds features around online presence, to enhance the user experience. The two main features showcased are sorting the students by topic/lab in which they are studying, and also the slack communication feature, whereby each student card has individual message and call (huddle) buttons, with an additional group huddle button per topic.

Project Type: Web App, UX / Front End, Open Source

Technologies: Javascript, Slack, Github, typescript, sveltekit, tailwind, Git and GitHub

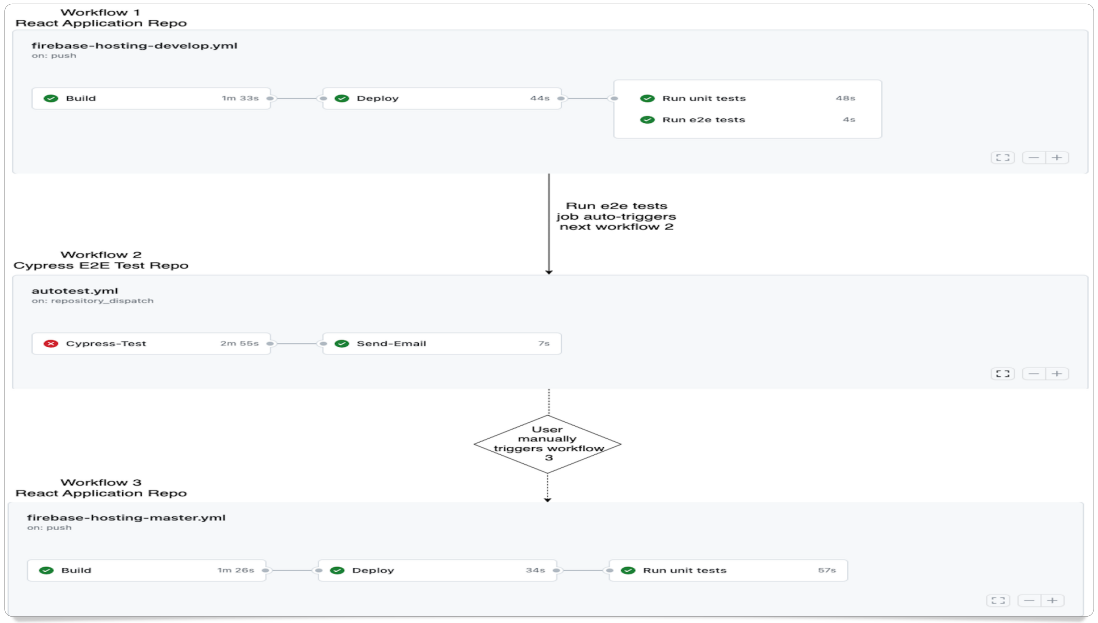
http://bit.ly/3TMHxHM

CI/CD framework for automated deployment

LOCATION
TL235 – 88

CI/CD framework for automated deployment and UI/API tests with test automation

by Cathal Duffy



There are three key elements to this project. The first, an application that was built in a previous module using React.js. The web application will be hosted on Firebase and use the web application's GitHub repository as part of the pipeline. The second area focuses on automated testing. Automated tests are built using the Cypress framework. The third and final area of the project focuses on building a CI/CD pipeline. When a build is triggered for the web application, this will trigger automated tests to run, thus ensuring that when code is updated, full functionality remains.

Project Type: CI/CD (Pipeline), Testing

Technologies: React, nodejs, Cypress, GitHub Actions

https://project-page-host.web.app/

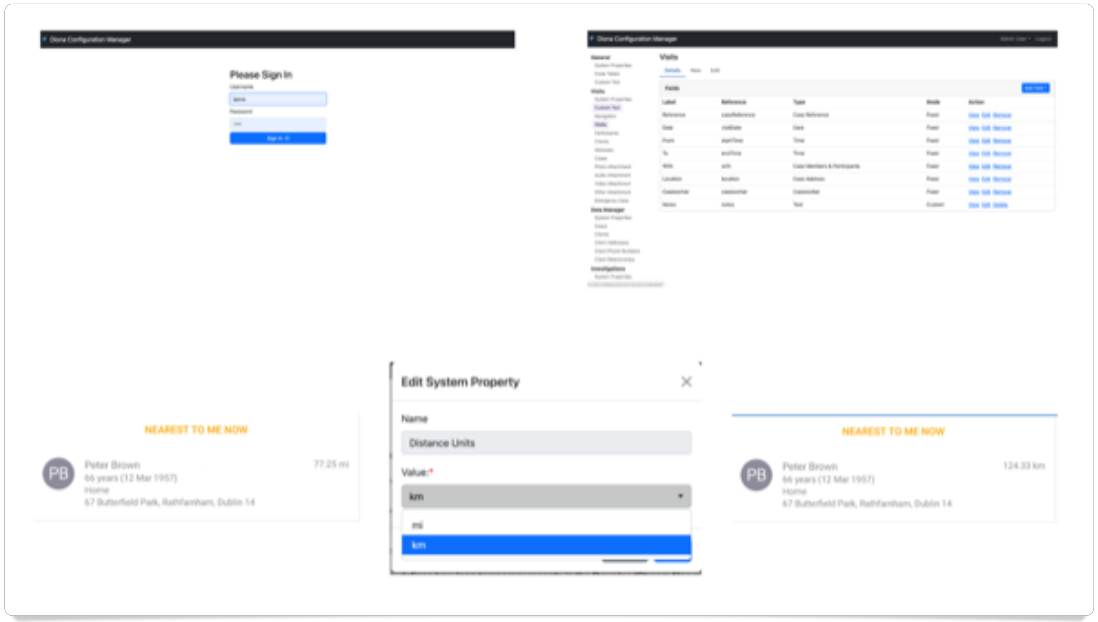
Diona Configuration Manager

Replace Existing Configuration Manager Application for Diona Solutions

LOCATION

TL235 – 86

by David Fagan



The Diona Configuration Manager is a web based configuration tool. All solutions created by Diona are highly configurable. The app can be used to configure a comprehensive range of applications and system level properties, including but not limited to: Business configurations such as types of documents that can be uploaded, assessment and form definitions, dynamic screens. Technical configurations such as session timeout, security, auditing and system logs. The aim of the project is to replace the existing config manager which was built on older technologies with a newer web application that is more extensible and easier to manage.

Project Type: Web App, Workplace Project - Public

Technologies: NodeJS, MongoDB, JavaScript, ExpressJS, PUG HTML, Bootstrap CSS

http://bit.ly/3n5V693

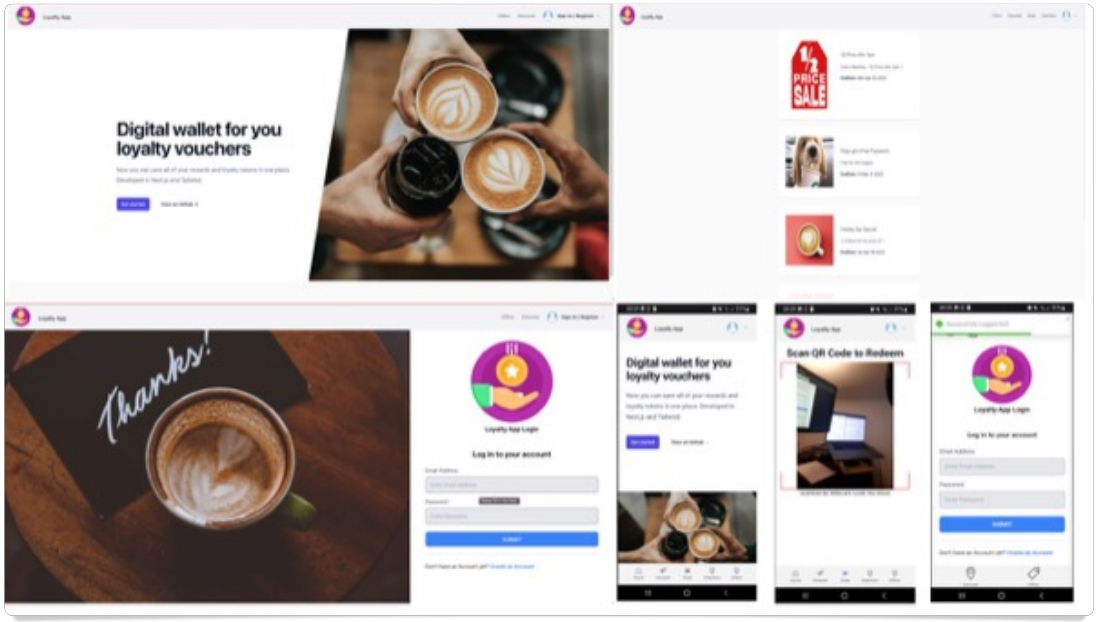
Loyalty App

Development of a PWA (Progressive Web App) with Next.js, Tailwind and Strapi CMS

LOCATION

TL238 – 77

by Jason Grant



Full-stack prototype of a customer loyalty web application. Aims to encourage customer loyalty and drives business success with the ability to track engagement and push offers to the consumers.

Project Type: Hybrid Mobile App, Combined Web & Mobile,Web App

Technologies: Next.js, Strapi, React, JavaScript, Tailwind, Toast, Vercel, Heroku

https://loyalty-app-final-project.my.canva.site/

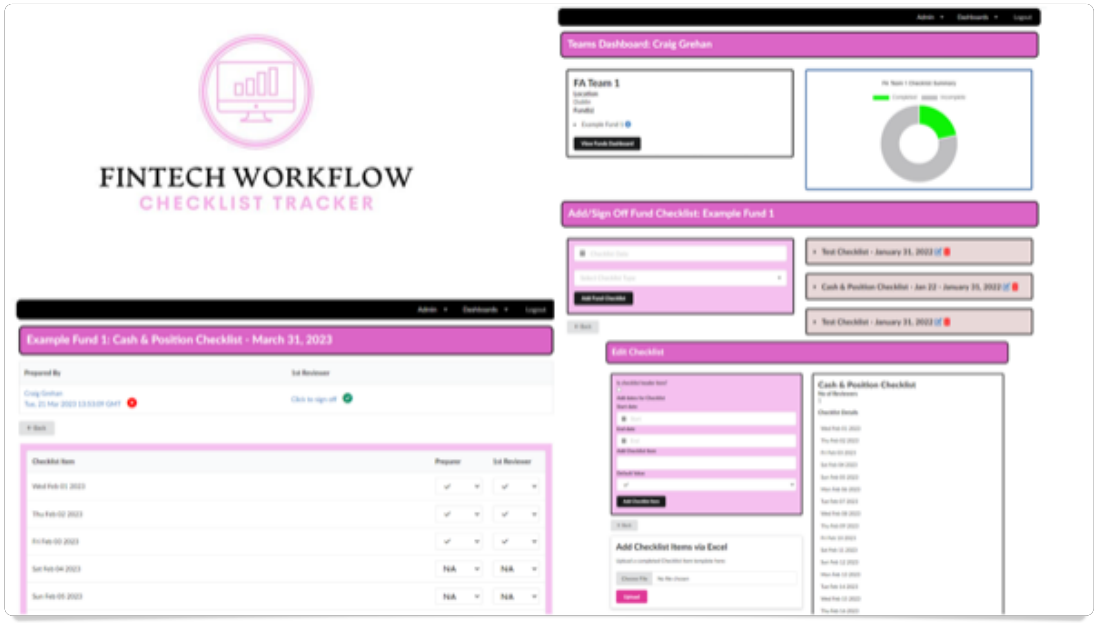
Fintech Workflow Checklist Tracker

An application to monitor the status of company checklists

LOCATION

TL238 – 78

by Craig Grehan



Currently the business I work in is very focused on process controls. This means there are several process checklists to be prepared and reviewed across teams in the company at various intervals. These checklists cover several different tasks. The current process is very disjointed and often checklists are left incomplete or not fully signed off by preparers/reviewers. This creates a lot of additional work in rechecking the status of checklists. The Fintech Workflow – Checklist Tracker, aims to centralise this process and offer a visual dashboard of completed and incomplete checklists, reducing workload and improving efficiency in this business area.

Project Type: Web App

Technologies: NodeJS, JavaScript, MongoDB, Semantic UI, Cloudinary

https://bit.ly/3JAv19G

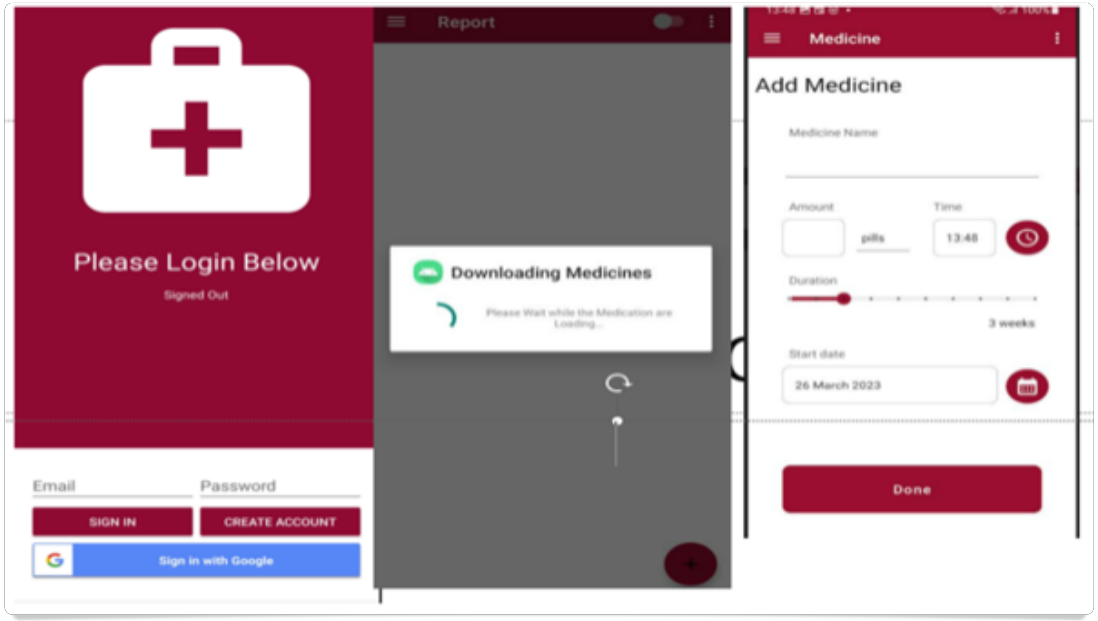
Carer/Patient App

Carer/Patient App

LOCATION

TL238 – 74

by Nora Hackett



The Carer/Patient app is an android native mobile app that allows users to track their medicine and schedule reminders. Users input their medication that they want to track with details such as Medicine Name, Medicine Quantity, Time, Duration and Start Date. Key technologies used: Kotlin Firebase, Agile methodology, GitHub

Project Type: Native Android app

Technologies: Kotlin, Andriod Studio, Firebase, Github

https://carerpatient.my.canva.site/

Tutors

An Open Learning Web Toolkit

LOCATION

TL235 – 85

by Jordan Harrison

A collection of open source components & services supporting the creation of transformative learning experiences using open web standards.

Project Type: Web App, UX / Front End, Open Source

Technologies: NodeJS, TypeScript, Svelte, SvelteKit, TailwindCSS, Netlify, GitHub

https://tutors-final-project.netlify.app/

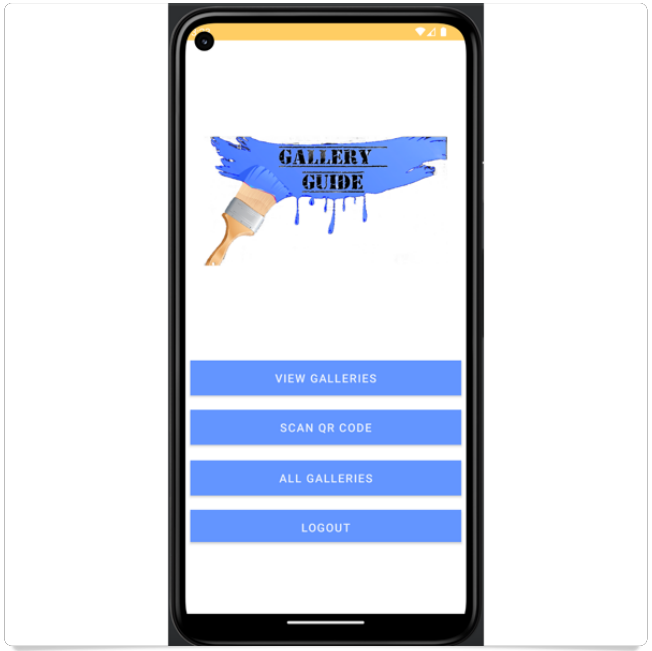
Waterford Gallery Guide

Native android application for Waterford City art attractions

LOCATION

TL238 – 72

by Dale Healy Egan



The Waterford Gallery Guide is a comprehensive and user-friendly native Android application, developed using the Kotlin programming language. It is designed to enhance the experience of visiting local art attractions in Waterford city. The application offers a range of features, including the ability to scan QR codes, add preferred attractions to a personal list, and view current attractions. Its compact design and intuitive interface provide users with a delightful and convenient experience

Project Type: Native Android app

Technologies: Kotlin

https://linktr.ee/dalehealy1609

KPI with POWERBI

Streamlining report building with PowerBI and PowerShell

LOCATION

TL245 – 94

by Anders Ingelsten

Previously data for reports was pulled manually from local and cloud-based systems and then processed by staff into report visuals. This project streamlined and automated this process. By pulling data via system APIs and then making it available to PowerBI by storing it as CSV Data in SharePoint Online. PowerBI was then utilised as the visualisation tool, to display the stored data, as interactive KPI reporting diagrams on the company's intranet. PowerShell was used as the scripting language to facilitate the data pull and storage. Automation was then applied to the data pull and the PowerBI data refresh.

Project Type: Workplace Project

Technologies: PowerShell, SharePoint, PowerBI, DAX, CSV

https://bit.ly/3yWCkDB

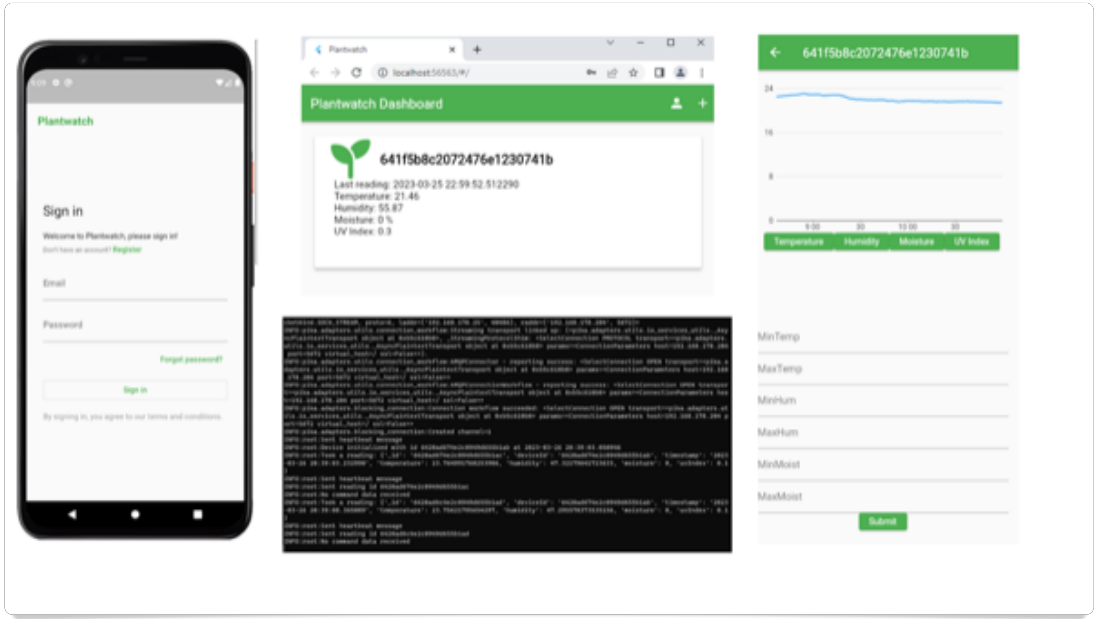
Plantwatch

IoT Plant Health Monitoring System

LOCATION

TL245 – 91

by Harry Kelly



Plantwatch is an IoT plant health monitoring and care system that utilises electronic sensors and a Raspberry Pi to collect data on soil moisture, temperature, humidity, and light intensity. A backend service communicates with the Raspberry Pi via RabbitMQ, logs sensor data to a MongoDB database, and sends control data back to the Raspberry Pi, which can also operate actuators for environmental control. A web and mobile application allows the end user to add devices to their account, view sensor data, and set desired parameters. Flutter provides the frontend and interfaces with MongoDB via a REST API implemented in Dart.

Project Type: Physical computing (IOT), Combined Web & Mobile, Web App

Technologies: Raspberry Pi, Python, Dart, RabbitMQ, MongoDB, Flutter, Firebase

https://bit.ly/3THRnuk

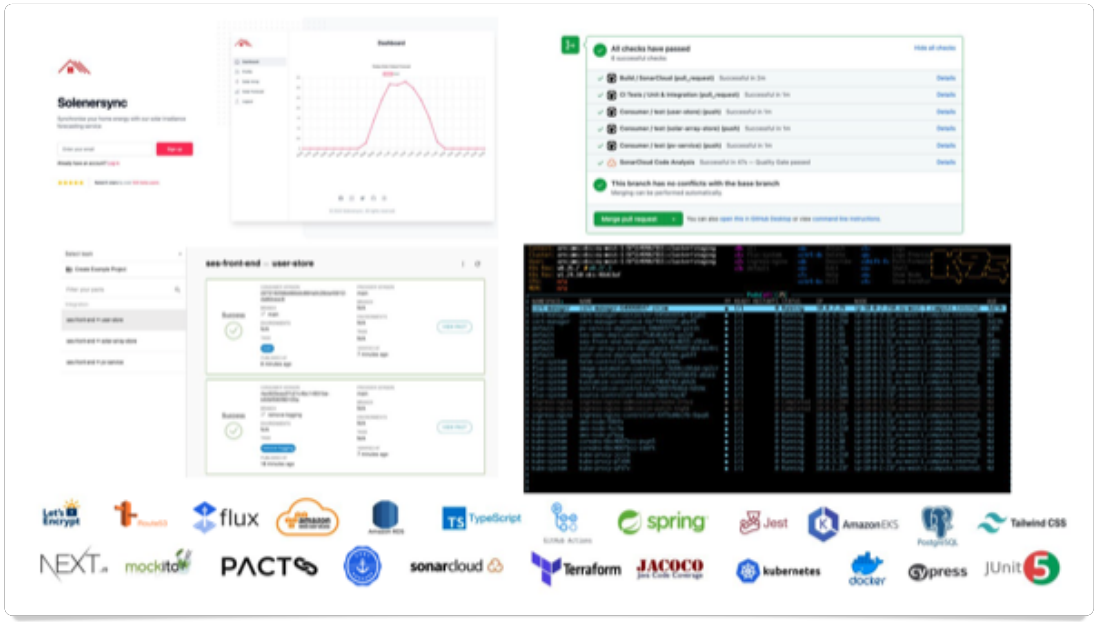
solenersync.net

A test strategy for microservices

LOCATION

TL235 – 89

by Brian Kinsella



This project showcases a scalable automated testing strategy that integrates with modern microservice architectures and promotes continuous integration and continuous deployment (CICD), without impacting on delivery. To illustrate the various types of testing, the project also features a solar forecasting web application, which includes the development and provision of application infrastructure, CICD pipelines, back-end and front-end microservices, as well as the implementation of various test frameworks. The project not only highlights the layers of testing embedded within the microservices, but also demonstrates end-to-end application development and deployment.

Project Type: CI/CD (Pipeline), Testing, DevOps

Technologies: Kubernetes, Flux, Pact, Junit5, Jest, Spring, Java, Next.js, Typescript

https://bit.ly/bkses

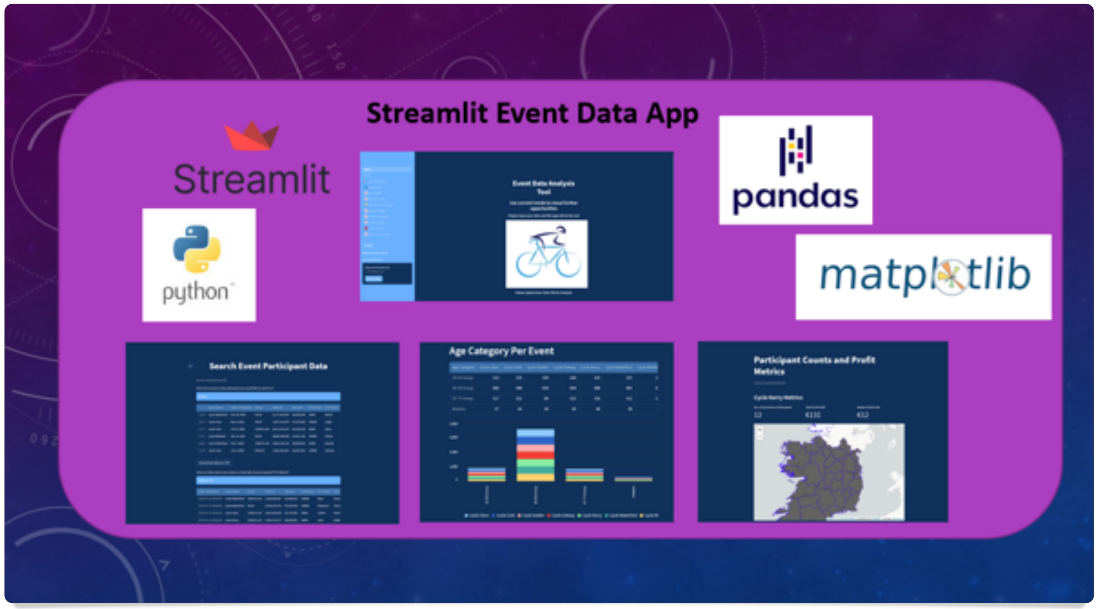
www.MyEventInsights.com

Streamlit Sports Event Data Analysis Application

LOCATION

TL235 – 81

by Sheila Kirwan



This project is an interactive streamlit data analysis application. The purpose of this application is to provide a sports event company with a means of analyzing participant data in order to capture useful marketing insights. A user logs in to the app and uploads a .csv data file to the application. Using Python, Pandas, MatPlotlib and various other python libraries, the application filters the data in order to present the findings in a visually interesting and logical manner. The outputted visualizations are displayed using tabular, graphical, interactive, and animated formats.

Project Type: Web App, Data Analytics

Technologies: Streamlit, Python, Pandas, AWS EC2 and many more

https://skirwan.surge.sh/

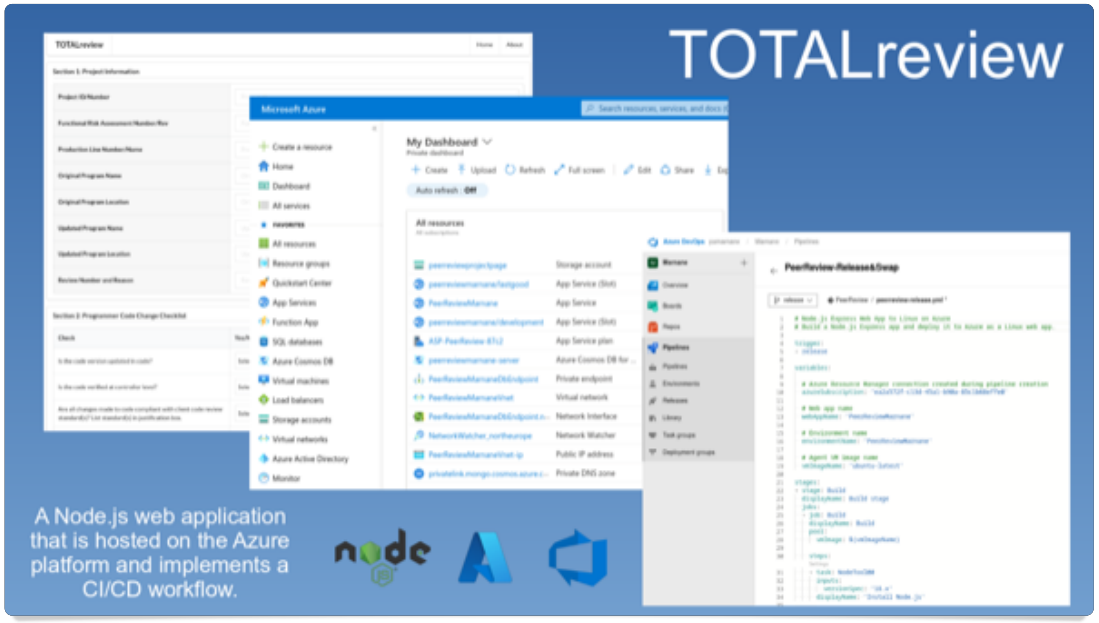
TOTALreview

Azure Hosted Peer Review System

LOCATION

TL235 – 87

by Patrick Marnane



TOTALreview is a Node.js application that is hosted on Microsoft's Azure platform and utilises a number of its services including App Service, CosmosDB and Active Directory. Application development also implements a CI/CD workflow using Azure DevOps. The web application's function is to be used by Manufacturing Equipment developers to record changes and track the peer review process.

Project Type: CI/CD (Pipeline), DevOps, Workplace Project - Private Code Repo (NDA not required)

Technologies: Node.js, Microsoft Azure platform, Microsoft DevOps platform

http://bit.ly/3lBOuk5

Ariba Issue Resolution

Ariba Issue Resolution Power App

LOCATION

TL245 – 96

by Claudia Marques

This is a Power Application (used in Microsoft) that is used to search an issue that a user is experiencing in purchasing process and then providing the solution to this issue. This app also would have training material, a calendar and contact information to make the application as beneficial as possible for the user during the purchasing process.

Project Type: Web App, MS Power Platform

Technologies: Power Fx

https://airpowerapp.my.canva.site/

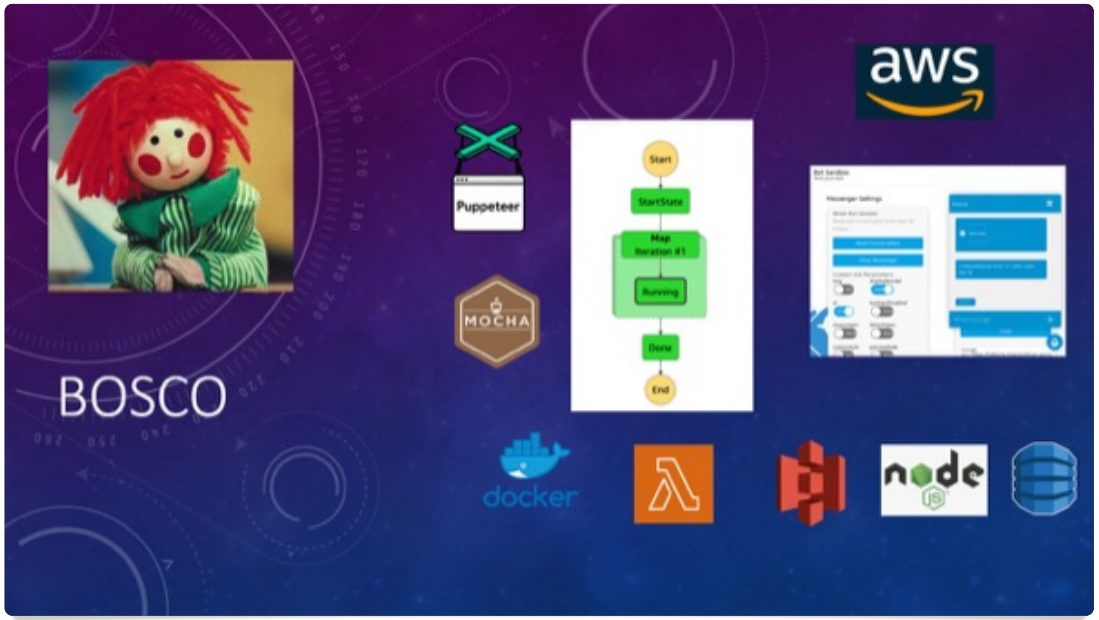
Bosco

Optimising Test Runner Performance through Serverless Computing

LOCATION

TL245 – 92

by Margaret McCarthy



This project involves building a serverless test runner for a chatbot-based company, using AWS Lambda Step Functions, Mocha, and Puppeteer. The test runner executes end-to-end unit tests on two adapters and stores results in DynamoDB and failed screenshots in S3. CloudWatch is used to log results. The test runner is deployed across multiple AWS regions using CloudFormation, making it highly scalable and fault-tolerant, while also eliminating the need for managing and scaling EC2 instances, resulting in significant cost savings. The project was written in NodeJS using Javascript, a Docker container and multiple AWS services.

Project Type: Testing, Serverless, CI/CD (Pipeline

Technologies: NodeJS, AWS Lambda Step Function, Docker, Puppeteer, Mocha

https://bosco.surge.sh/

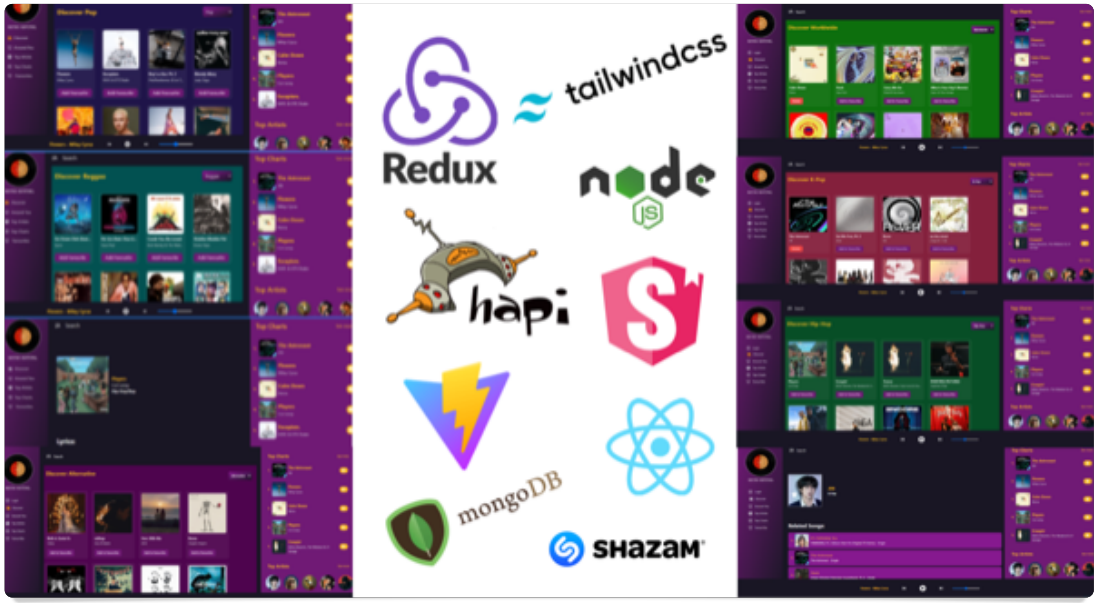
Retro Revival

Ux Exploration of Music-Playing Progressive Web Application

LOCATION

TL235 – 83

by Sophia McGee



Retro Revival is a music app that uses React and Redux, along with Tailwind CSS and the Shazam API, to offer a seamless experience for exploring and discovering new music. With Redux, it provides state management for smooth interactions. The retro aesthetic, with a purple, orange, and black color scheme, adds to the vintage feel, while intuitive UX design enables easy navigation between genres and chart-toppers. Combining local streaming and API integration, Retro Revival delivers a secure and reliable platform for all music enthusiasts. Relive the past and discover new favorites with Retro Revival! .

Project Type: Web App, UX / Front End

Technologies: React 18, Vite, Redux, Storybook, Hapi, MongoDB, Shazam, , Javascript, Tailwind

https://adobe.ly/3FR9gBb

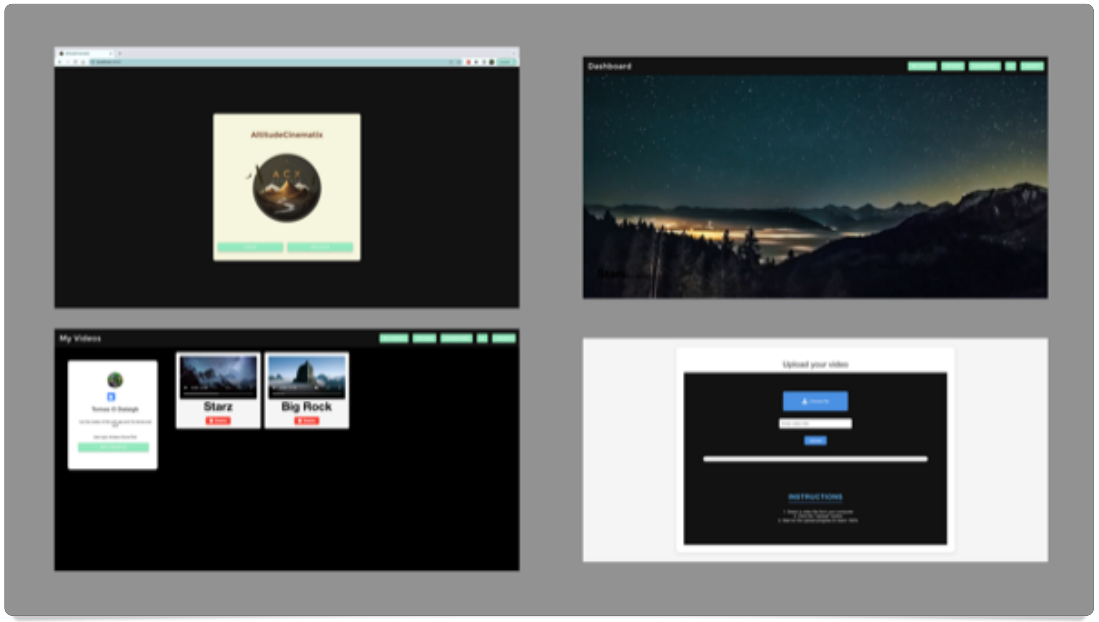
AltitudeCinematix

A web app for viewing and uploading aesthetic long form video

LOCATION

TL235 – 80

by Tomas O Dalaigh



AltitudeCinematix is a video platform focused on aesthetically pleasing content. Users can view and upload videos, creating a community that values visual artistry. The app encourages engagement with features like video ratings and weekly charts, fostering a dynamic and enjoyable experience for creators and viewers alike.

Project Type: Web App

Technologies: React, nodejs, JavaScript, Ionic, Firebase and TypeScript

https://hdipfinalbytomas.com

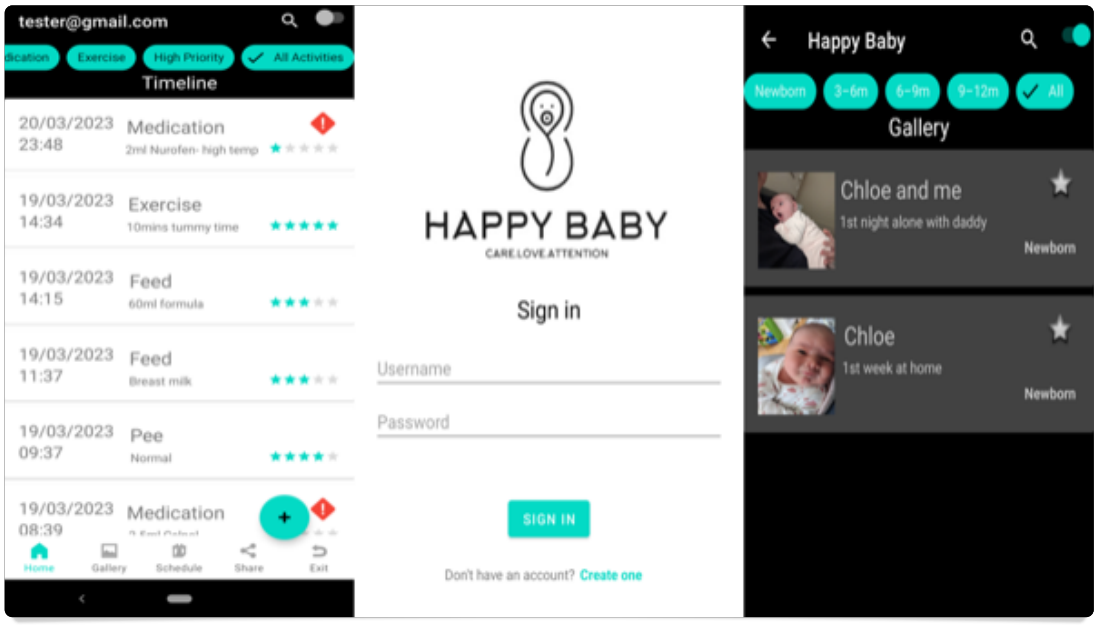
Happy Baby

An Android Baby Tracker App

LOCATION

TL238 – 70

by Colm O Keeffe



Happy Baby is a Native Android Application built in Android Studio using the Kotlin programming language. This is an app for parents/caregivers to track the activities of their baby in their early critical development period. These activities, such as their feeds, sleep, nappy change, medication and exercise are logged so that the general welfare of their baby or babies is tracked. Reminders for related events can be set within the app and a gallery of milestones can be created. The purpose of this app is to achieve these objectives using a simple, intuitive and effective app.

Project Type: Native Android app

Technologies: Android Studio, Agile methodology, Kotlin, Firebase, Picasso

https://sites.google.com/mail.wit.ie/happybaby/home

Subject to NDA

Project Details are Subject to NDA

LOCATION

NDA – 99

by Declan O' Donovan

A number of projects on the HDip in Computer Science are subject to NDA. Such projects are supervised and graded as normal while honouring the term of the NDA.

Project Type: NDA, Workplace Project, Web App

Technologies:

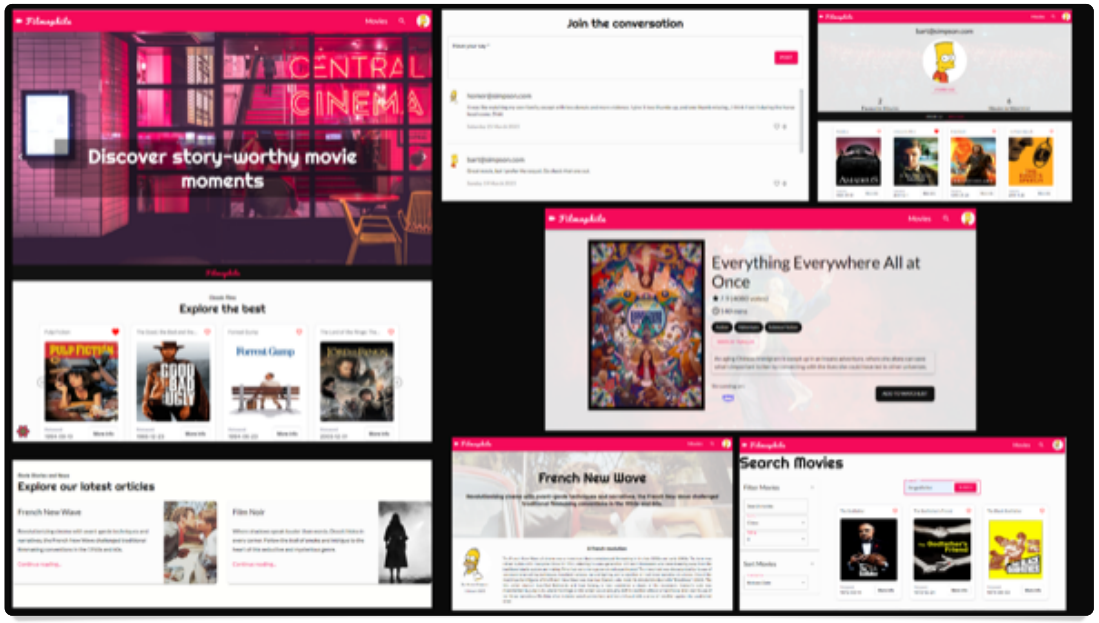
Filmophile

A front-end focused full stack web application

LOCATION

TL238 – 79

by Owen O'Donnell



Inspired by a love of cinema, Filmophile is a web application for movie fans. With an emphasis on community, it offers tools for managing personal viewing, sharing opinions, discovering new titles and learning about film through curated editorial content and recommendations. Filmophile merges functionality, social interaction, and educational aspects, providing a comprehensive movie experience to users. Built with React.js and Material UI, the application is fully responsive. Firebase powers authentication and data storage, while the Movie Database API serves as the source of data on movies. The application is deployed using AWS Amplify.

Project Type: Web App

Technologies: React, Material UI, Joy UI, Firebase, AWS, JavaScript, HTML, CSS, TMBI

https://sites.google.com/view/filmophile

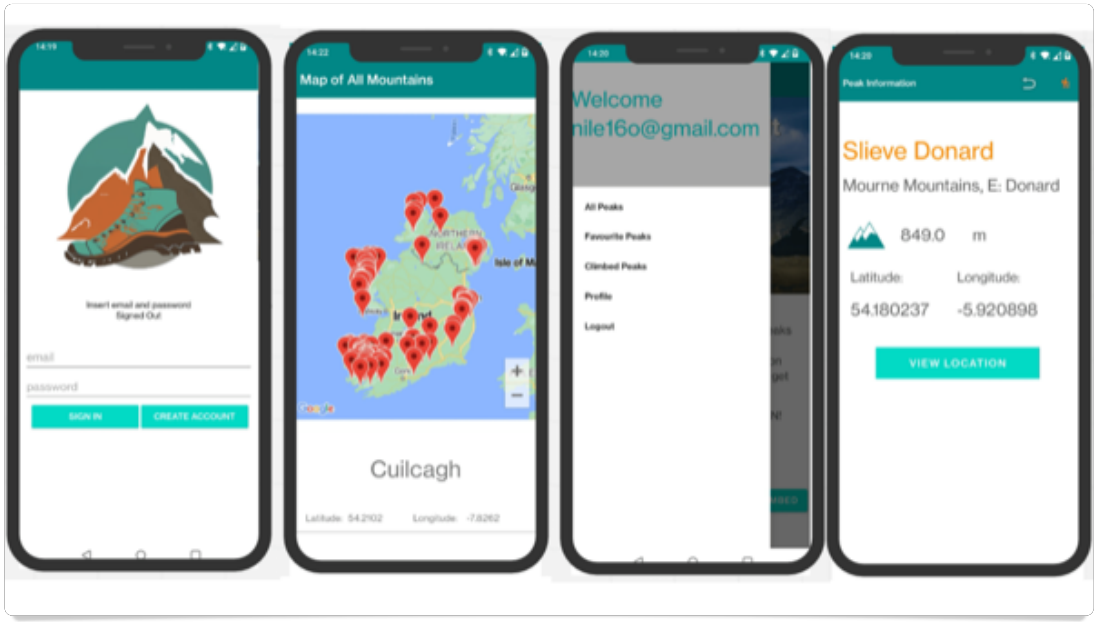
Trek It

A Mountain Trekking and Tracking App for Android

LOCATION

TL238 – 73

by Níle O'Hagan



TrekIt, a mobile application that helps you plan your mountain trekking adventures. This Native Android mobile application provides users with information on each of the 100 highest peaks in Ireland, including their height and location. Users can track their progress as they complete each peak, with the app recording their completion times and providing a record of their achievements. The application was developed using Kotlin in Android Studio. Firebase Authentication and Firebase Realtime Database were utilized to reduce back end development requirements.

Project Type: Native Android app

Technologies: Kotlin, Firebase Authentication, Firebase Realtime Database, GoogleMaps

https://bit.ly/TrekIt_20095361

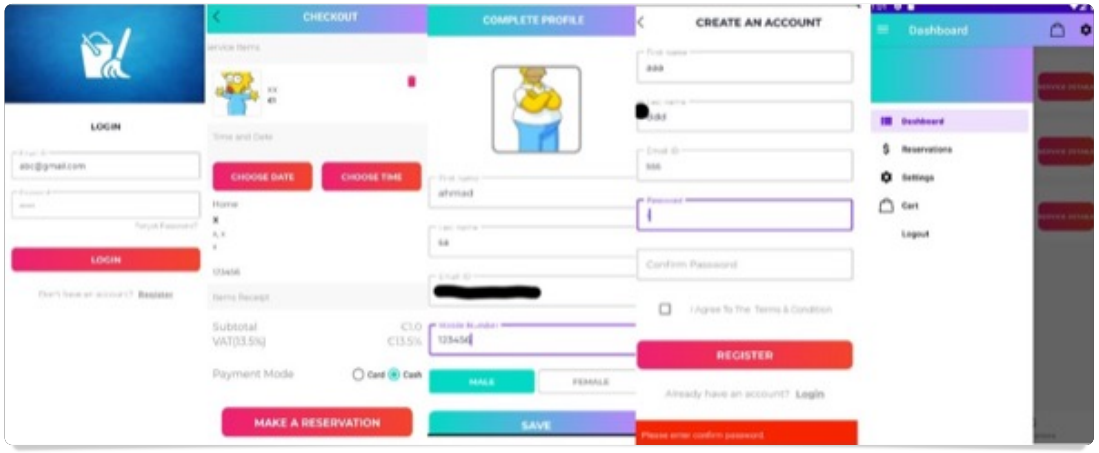
SuperCleaner

Android app to make reservations for services

LOCATION

TL238 – 69

by Ahmad Sabeh-Murphy



SuperCleaner is a mobile application designed to simplify the process of booking cleaning services for a small enterprise. The app offers an easy-to-use platform for users to reserve services in their local area and provides an intuitive dashboard for the enterprise to manage and administer the services they offer, a shopping cart, where users can select and purchase multiple services, as well as a payment gateway to complete transactions. The app also provides a user-friendly interface to view reservation history.

Project Type: Native Android app

Technologies: Kotlin

https://bit.ly/3JMM0pd

Subject to NDA

Project Details are Subject to NDA

LOCATION

NDA – 100

by Tom Tobin

A number of projects on the HDip in Computer Science are subject to NDA. Such projects are supervised and graded as normal while honouring the term of the NDA.

Project Type: NDA, Workplace Project

Technologies:

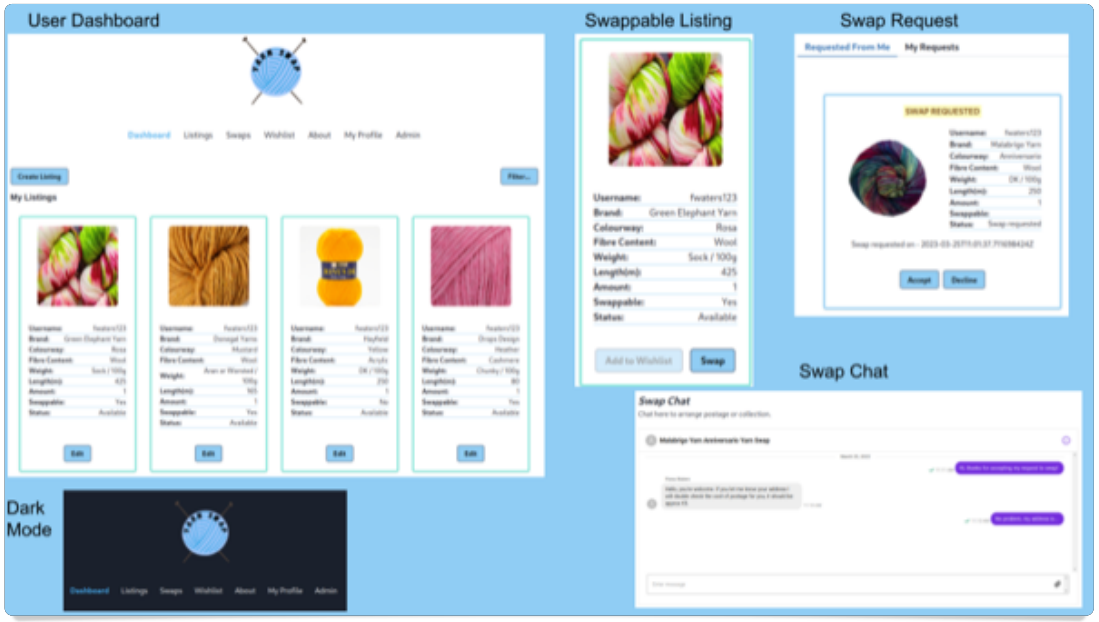
Yarn Swap

Progressive Web App Community Swap Platform

LOCATION

TL238 – 76

by Fiona Waters



Yarn Swap is a Progressive Web App that allows community members to share items with each other that may have otherwise been left unused. This serves to reduce waste while also fostering a sharing community that can contribute to a circular economy. Yarn Swap focuses on the exchange of Yarn in the Craft Community but use of the application could be transferred to many other areas including clothing, books etc. Yarn Swap has been created with a React.js, Vite.js, ChakraUI frontend, a Golang, Gin backend and employs Firebase Realtime Database for data storage.

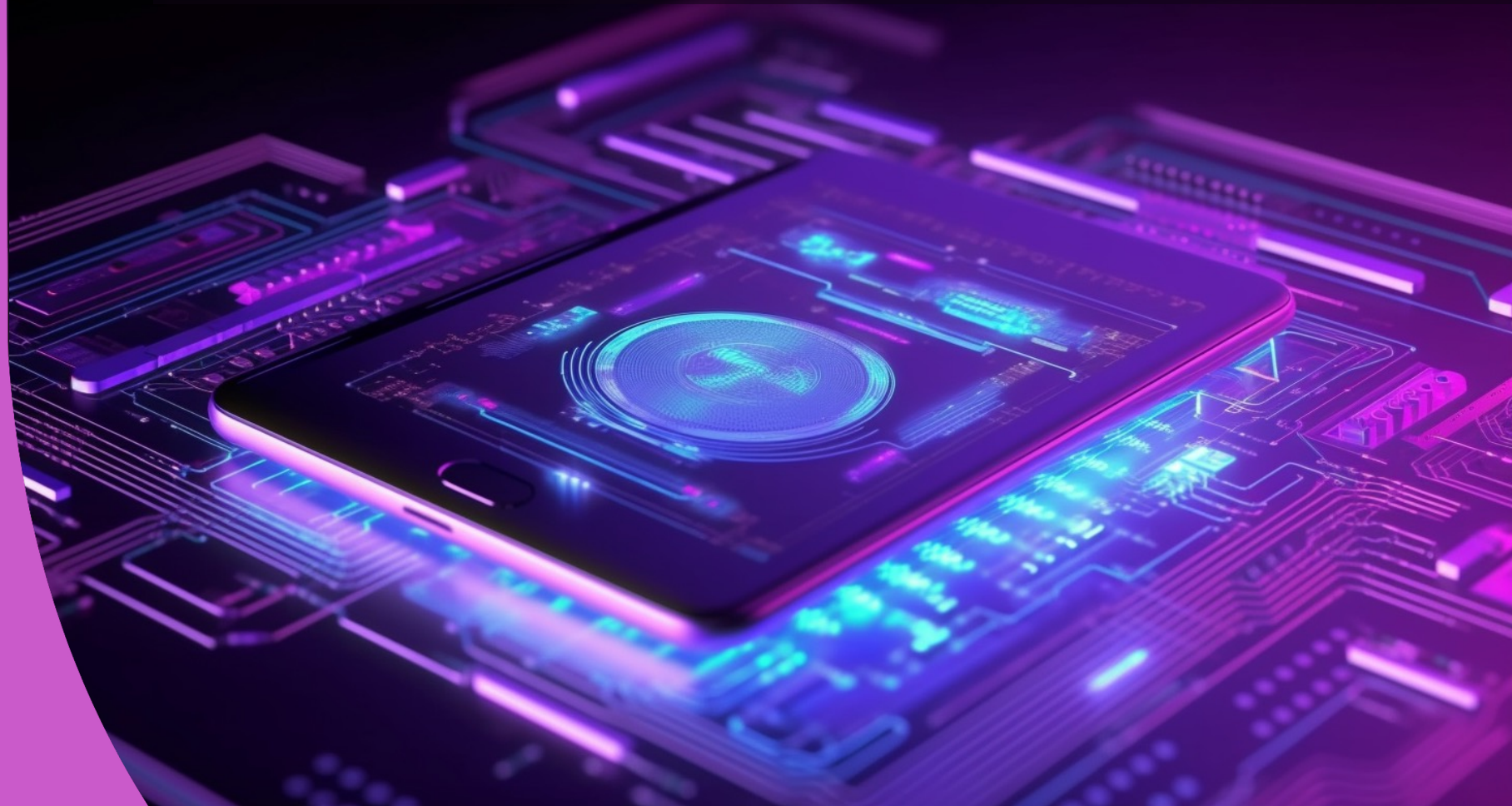
Project Type: Web App - Progressive, CI/CD (Pipeline), Testing

Technologies: React.js, Vite.js, ChakraUI, Golang, Gin

https://bit.ly/3nbPHx0

SECTION 3

Master of Science - MSc



MSc in Computing

The MSc in Computing currently has two cohorts:

- MSc in Computing (Enterprise Software Systems)
- MSc in Computing (Information Systems Processes)

The aim of the MSc in Computing (Enterprise Software Systems) is

to produce graduates with the necessary knowledge, skills and expertise in the development and management of software systems. The course also confers on the graduates a set of personal and professional attributes that will allow them greater flexibility in the development of their own career options, over the span of their career. Specifically, the course aims to produce graduates who can:

- Reason and problem-solve to a high level in the context of enterprise software and its role in business, industry and research.
- Participate constructively in the strategic deployment of enterprise software in a mobile or cloud environment.
- Manage the development of high-quality enterprise software products and services.
- Undertake research-based projects, providing effective advice and leadership where required.

The aim of the MSc in Computing (Information Systems Processes) is

to provide graduates, from any discipline, with a broad sociotechnical perspective of modern information systems and their development. The socio–technical focus renders the MSc in Computing (Information Systems Process) philosophy and objectives as distinct from information technology-oriented programmes. Whereas information technology oriented programmes focus primarily on the development of technical artefact and data, the MSc in Computing (Information Systems Process) takes a much broader and multidisciplinary perspective to encompass human-centred and organisational processes, knowledge, and values that also comprise an information system and its environment.

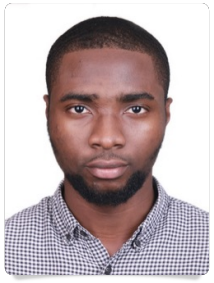
Projects

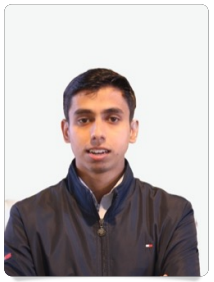
MSc in Computing (Enterprise Software Systems)


Arbaz Ahmed


Rukmangathan Annadurai


Warren Byron


Ikechukwu Festus-Ihedioha


Muaz Hassan


Yiming Hu


Matul Jain


Christos Koutsiaris


Darren Leniston


Hari Venkata Sai Ganesh Lolla


Alka Nixon


Aaron Pinto


Puttaswamy Harsha Puttaswamy


Qi Zeng

Identifying Cancer Mediating Biomarkers Using a Gene Selection Approach Based on Clustering

by Arbaz Ahmed

Cancer is a complex disease that affects millions of people worldwide, and the identification of cancer biomarkers is crucial for early diagnosis and effective treatment. In recent years, gene expression data analysis has become an essential tool for identifying cancer biomarkers. In this dissertation, we propose a gene selection approach based on clustering using the k-means algorithm to identify cancer mediating biomarkers. The proposed approach involves four main steps: data preprocessing, clustering, feature selection, and classification. First, the gene expression data will be preprocessed to remove noise and normalize the data. Then, the k-means algorithm will be used to cluster the genes based on their expression levels. Next, feature selection will be performed to select the genes that are most relevant to cancer. The effectiveness of the proposed approach will be evaluated using publicly available gene expression datasets. The results of the proposed approach will be compared with existing approaches to demonstrate its effectiveness in identifying cancer mediating biomarkers.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Study of Attribute Based Access Control with Ontologies

by Rukmangathan Annadurai

One of the most widely used types of access control systems is attribute-based access control (ABAC). Systems for access controls are used to safeguard resources against unwanted access or use, such as network devices or IT resources. Extensible Access Control Markup Language (XACML) is a policy language built on Extensible Markup Language (XML) that is used to define security policies and information access requests. XACML can be difficult sometimes. This is because of a variety of factors, including how challenging it can be to understand XACML principles and the difficulties in maintaining XACML-expressed policies. The purpose of this project is to study a human pleasant way to configure and administer ABAC policies using ontologies. Every physical or digital entity with attributes that can also represent a relationship between the entities can be described using an ontology. An ontology can be developed and described in a variety of ways. The goal of this project is to make use of the OWL framework and the Protege tool for creating, designing, and using ontologies.

Technologies:

Python, OWL, Protege

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Blockchain Business Applications in Irish Tourism: Developing a Proof of Concept Business Case for an NFT

by Warren Byron

This research project examines how NFTs and blockchain technology may be used to improve a digital business process. It contributes to the National Development Policy and Professional Practice through a technological and architecture survey; and to the role of blockchain technology in strategic industrial policy through an engagement with the BCI EWG. Among the contributions and implications for scholarship are addressing gaps in the literature pertaining to blockchain business models beyond cryptocurrency and ICOs that are currently not well understood, as well as blockchain development engineering methods that are underdeveloped for national-level proof of concept projects. Using well-architected principles, the prototype stack consists of a react.js frontend, a scalable serverless AWS API backend, and interactions with the Flow Blockchain smart contracts through Cadence queries and transactions. The proof of concept system allows tourists to collect minted NFTs via QR codes posted at key attractions. It also demonstrates how data analytics and integration with third-party partner organisations may offer additional value to the tourism sector through the use of NFTs.

Technologies:

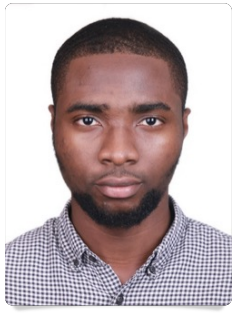
React.js, Frontend, AWS Backend, Flow Blockchain, Python, JS, Cadence

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

http://ireland.nftpassport.travel/

Exploring the Usability of Low-Code Platforms: A Study of Common Challenges and Successes

by Ikechukwu Festus-Ihedioha

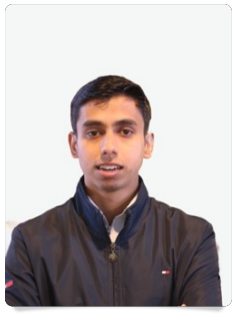


The increasing trend towards higher levels of abstraction in software development has led to the emergence of Low-Code Development Platforms (LCDPs), which are gaining popularity in software development, due to their promises of increased speed and efficiency. LCDPs offer a simplified approach to software development through the use of graphical interfaces to provide a more streamlined and intuitive development experience. They significantly improve the speed and efficiency of the development process, and bridge the knowledge gap hindering broader participation in software and software process creation. However, adoption of LCDPs has been low due to both platform- and user-specific factors. As a result, this study explores the aforementioned factors in a view to address and increase the adoption of LCDPs.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A Mobile Application to Detect Potato Diseases Using Machine Learning Techniques

by Muaz Hassan



Globally, potato is considered as the third most important food in terms of consumption and the most important crop in the non-cereal domain. Potatoes need a lower portion of resources compared to cereals as it is a water-efficient crop. It also yields fourfold more than a grain crop for the same area. Potatoes are utilized as human food, animal feed, and seed tuber. Circumstances like waterlogging, temperature drops, and climate change act as a catalyst for destructive potato diseases like late blight and early blight. These diseases can reduce the yield to 0%. To minimize the loss, one must timely detect the disease. A manual checkup requires expertise, human efforts, and frequent checkups across the life cycle of a crop. Automating disease management will be of substantial aid to the farmers. In the agriculture sector, deep learning has decent traction in distinguishing plant diseases. Existing potato disease detection models are trained on small and outdated datasets. When training on a small dataset, it is difficult to train for complex features while avoiding the risk of overfitting and providing a robust output.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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Deep Gait Analysis for Healthcare Applications

by Yiming Hu

The main objective of this research is to develop a convolutional neural network algorithm that can be used to assist in gait analysis in healthcare by simply inputting data from an IMU (Low-cost MEMS inertial measurement unit) device, and ultimately to determine, for example, the health of the person from whom the data originates, the degree of recovery of the patient after surgery, or to Parkinsons disease monitoring and the prevention of accidental falls in the elderly. Once the algorithm has been designed, I will also compare it with the most popular deep learning algorithms such as Vgg16, ResNet50 and Googlenet. It is therefore hoped that this research will have the opportunity to improve the detection process in the healthcare field, as there is a need to find and solve problems by using only IMU data rather than images or even videos, thus significantly reducing the complexity of the multivariate time series process.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A Comparative Study Between the Selection Criteria Used When Choosing the Waterfall or the Scrum SDLC Approaches

by Matul Jain

This research aims to investigate the decision-making process behind software development companies in Ireland choosing the Waterfall or Scrum SDLC approach for their software projects. The study also aims to identify the criteria considered by these companies in selecting between these two approaches and any challenges that may arise in the implementation process. A questionnaire will be used to gather data from software development companies in Ireland. The results of this research will provide guidelines for organisations considering implementing either the Waterfall or Scrum approach for their software development projects and help mitigate potential challenges. The findings will contribute to refining the SDLC selection process between these two approaches based on the actual practices of software development companies in Ireland.

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A Contextual Help Browser Extension to Assist Digital Illiterate Internet Users

by Christos Koutsiaris

The study examines the implementation of a browser extension that provides contextual help to users when they hover over technological acronyms and abbreviations on websites. It includes exploring the potential application of Artificial Intelligence (AI) technologies, specifically Natural Language Processing (NLP), for categorising web pages based on their technological content and determining whether OpenAI services can provide relevant definitions in tandem with a static dictionary. Lastly, one of the research objectives is to evaluate the impact of contextual help assistance on the understanding and comprehension of technical text and changes in reading rate in a group of digitally illiterate or minimally technology-exposed users. The research uses a mixed-method approach that combines qualitative and quantitative methods to get the most comprehensive and accurate data.

Technologies:

ReactJS, TypeScript, NodeJS, Plasmo, Google Cloud NLP, OpenAI

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

A Distributed Edge FLISR Solution & Network Simulation Test Platform

by Darren Leniston

The energy sector is facing wide-scale changes with the rapid introduction of disruptive distributed energy sources, renewables, electric vehicles and the changing relationship between the consumer and the utility. This has resulted in the need to leverage the capability of modern ICT and IoT technologies to meet the challenges presented by such changes. Of key concern is the resilience of the energy grid and the growing dependency on a stable supply to support business as usual activities and daily life for society at large. This project proposes a novel implementation of the concept of Fault Identification, Isolation and Service Restoration in a distributed fashion, enabled by Edge Computing techniques, to mitigate the effects of service loss to the end consumer and utility. The project focuses on the Irish energy grid in particular, and how such a solution can be leveraged to reduce the impact of fault events, particularly those resulting from inclement weather events which are increasing in frequency and severity as a result of climate change.

Technologies:

GoLang, Python, JavaScript, KubeEdge, Kubernetes, Docker, Neo4j, Postgres

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Technology Adoption and E-Readiness in Developing Regions - Supporting Socio-Economic Development Through Digitalization

by Hari Venkata Sai Ganesh Lolla

Given the effects of climate change and expanding populations, sustainable agriculture is becoming more and more critical. Climate change, the desire to end hunger caused by poverty, and the objective of enhancing human wellness all contribute to an ever-growing consideration about the sustainable development of agriculture. The capacity to cultivate responsibly while addressing rising food needs remain one of the major difficulties confronting agriculture in the twenty-first century. Digitalization of agriculture can contribute to socioeconomic development in several ways. For example, it can improve efficiency and productivity in the agricultural sector, which can lead to increased incomes and improved food security. It can also help to connect small-scale farmers to markets, which can expand economic opportunities and reduce poverty. One of the main specific barriers to technology adoption in agriculture is the lack of understanding about the technology by the farmers. This study will try to use current technologies like machine learning and data analysis to improve current agricultural practices in order to lead to a more sustainable future and lucrative agriculture.

Technologies:

Python, Machine Learning, Data Analysis, React JS, Node JS, Express JS

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
Cloud Computing	Computer Networks	Automotive and Automation	Internet of Things	Digital Graphic Design	Animation	Software Dev: Front End	Software Dev: Back End

Performance Comparison of Equivalent Cloud Services

by Alka Nixon

The cloud industry has become popular due to its flexibility, security and other key characteristics which suit an enterprise environment. Still, each organization has unique needs and choosing proper cloud services that suit them is a difficult task. Making it simpler to choose cloud service providers is the main objective of this research. We can say that cloud providers are all similar in the essence of the services they are providing. So,it is a hectic task to choose a specific use case. For instance, it can be challenging to determine which cloud provider gives the best performance, especially due to the lack of extensive, in-depth performance comparisons between cloud providers. The development of an application that performs the comparison of various public cloud services and displays the analysis results to the end user to help select a provider which suits them the best, is the goal of this research. This paper examines Amazon Web Services and Microsoft Azure, two of the most well-liked open source architectures. Comparison is done based on performance. The various metrics are I/O performance, memory usage, cost, CPU and network performance, elasticity, scalability and consistency.

Technologies:
AWS, Azure

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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3-Dimensional Object Reconstruction of Forensic Image Using Deep Learning

by Aaron Pinto

The "3D Object Reconstruction of Forensic Images Using Deep Learning" project aims to simplify the reconstruction of multiple objects from 2D images using deep learning techniques. An advanced neural network model will be developed with three technical enhancements, including convolutional neural network-based image denoising, saliency map-based object segmentation, and generative adversarial network-based 3D shape completion. The effectiveness of the model will be evaluated across various scenarios to assess its ability to handle multi-object scenes. The model will be deployed on Amazon Web Services with a user interface for easy access. This project has significant potential to aid forensic investigations by producing precise and accurate 3D models of objects recovered from crime scenes. Furthermore, the research outcome will contribute to the development of advanced deep learning models capable of handling complex scenarios and improving the accuracy of 3D object reconstruction from 2D images.

Technologies:
React, Js, Python(Keras, TensorFlow, PyTorch), AWS, Google Colab, Linux

Database and Analytics	Information Systems and Modelling	Computer Security	Computer Forensics	Game Development	Media Development and Production	Software Dev: Core	Software Dev: Mobile
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The Impact of Chatbots on Learning Outcomes and Engagement for E-Learning

by Puttaswamy Harsha Puttaswamy

The purpose of this dissertation is to investigate whether chatbots can have a positive impact on learning outcomes in e-learning. This study will focus on creating two chatbots, one that is friendly and another that is formal, and compare their impact on user engagement and learning outcomes.The study will be conducted in two phases: the development of the chatbots and the evaluation of their impact on learning outcomes. In the development phase, two chatbots will be created using natural language processing techniques. The friendly chatbot will be designed to use informal language and a conversational tone, while the formal chatbot will use more professional language and a serious tone. Once the chatbots have been developed and deployed Participants will be randomly assigned to one of the two chatbots and will be encouraged to interact with the chatbot and learn about a particular topic taught by the chatbot. To evaluate the impact of the chatbots on learning outcomes, participants will be assessed using a pre- and post-quiz to measure knowledge gain. In addition, participants will be asked to complete a survey to provide feedback on their experience using the chatbot.

Technologies:

Angular 14, Nodejs 16, AWS Dynamo DB, AWS S3, AWS ec2 instance, Dialogflow

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Comparative Evaluation of Code Quality Generated by GitHub Copilot and ChatGPT

by Qi Zeng

The main purpose of this study is to evaluate which tool, between GitHub Copilot and ChatGPT, can generate higher quality code. The algorithms being tested will come from the LeetCode question bank, including easy, medium, and hard difficulty levels. To test each algorithm, the code will be tested in three different programming languages, which are Java, JavaScript, and Python. For each algorithm, code will be generated using both GitHub Copilot and ChatGPT by entering the same comments, including the algorithm question name, description, function name, and question example. The generated code will be measured by correctness rate, Big O Notation, Cyclomatic Complexity, and Cognitive Complexity metrics. Finally, I will create a comparison table based on the measurement results to determine which tool generates higher quality code in the three languages, or which tool generates higher quality code in a certain language.

Technologies:

GitHub Copliot, ChatGPT, GitHub

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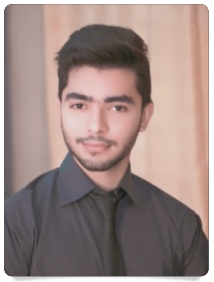
MSc in Computing (Information Systems Processes)

Aown Abbas

Funso Aringbangba

Abdullah Butt

Ammad Sarwar Cheema



Muhammad Usman Chughtai

Karan Gaikwad

Kiran Manwar

IoT Enabled System in Smart Cities for Green Energy for Developing Countries

by Aown Abbas

The development of smart cities in developing countries presents both challenges and opportunities for the implementation of IoT-enabled green energy technologies. These technologies have the potential to significantly enhance energy efficiency and sustainability, but face various obstacles such as inadequate infrastructure, insufficient funding, and lack of skilled manpower. This paper explores the key challenges and opportunities associated with the implementation of IoT-enabled green energy technologies in smart cities in developing countries, and proposes solutions to increase adoption and energy efficiency. Additionally, this paper examines the impact of smart grid technologies and real-time monitoring systems on energy consumption and renewable energy adoption in smart cities in developing countries, and offers recommendations for integrating these technologies into existing urban infrastructure to enhance sustainability and energy efficiency.

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Requirements Engineering Complexity in Customer-Facing Banking Services in Nigerian Application Support Teams

by Funso Aringbangba

Requirements engineering (RE) is a critical process in the development of software systems, particularly in customer-facing banking services. The complexity of requirements engineering in such applications is influenced by a range of factors, including the dynamic nature of the banking industry, changing customer needs, and the need to comply with regulatory standards. Requirements engineering is a very important phase in developing and enhancing some of the channels used to deliver digital banking services, online and mobile banking applications fall into this category. It has been observed over time that to enhance or develop these digital channels, it is often required to carry out requirements engineering to know what enhancements to add or new features to build. However, it is not always easy to carry out this phase as there are issues inherent in it that tend to make the process a complex task. In view of the foregoing, an attempt is being made to look at the interplay of factors that introduce complexity into this phase of development of digital applications and to what extent these factors affect the process.

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Building an Industrial Digital Twin on IoT Using MQTT

by Abdullah Butt

This survey of the literature looks at the use of digital clones in industrial contexts. Digital twins are real-time virtual copies of physical systems that imitate their behavior and performance. The study investigates the advantages of using digital twins in the setting of the industrial Internet of Things, such as increasing productivity, reducing downtime, and optimizing processes. It also examines the MQTT communication protocols usefulness as well as the use of digital twins in energy storage systems for real-time tracking, prediction, and optimization of energy flow. The study also investigates the use of digital twins for predictive maintenance and the merging of industrial IoT systems with blockchain technology. The review suggests a model that links the obstacles and enablers to effective digital twin adoption in the process industry. Lastly, the review recommends several research directions for future digital twin research, such as examining key technologies needed for execution and evaluating digital twin industrial uses at each stage of the lifespan.

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To Investigate the Use of Information Technology in the Hospitality Sector: A Case Study of Hotels in County Waterford

by Ammad Sarwar Cheema

Hotels are essential to providing lodging and services to visitors and business travelers, and the hospitality sector is a significant one for the Irish economy. Information technology (IT) solutions have become more widely used in hotels in recent years, and many of them have begun to deploy cutting-edge systems to improve operations and the quality of their services. In order to better understand how IT systems are used in hotels in Ireland's South-East and how they affect the hospitality sector, this research project will look at how they are used. The study's research questions focus on the South East's hotels' current IT adoption, the kinds of IT systems and software being used, the quality of training being given to hotel workers, and the standards upheld to ensure dependable technology. During each stage of the study, a cutting-edge analysis will be conducted using a mix of four bibliographic methodologies in an effort to provide answers to these issues.

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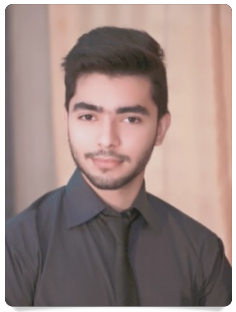
Waste Management Disposal

by Muhammad Usman Chughtai



Waste management and disposal is a major issue in Pakistan, where inefficient and inadequate systems have resulted in severe environmental, social, and economic implications. The purpose of this research is to investigate how to enhance garbage disposal in a Pakistani town Lahore. The research objectives are to identify the towns current waste management practices, analyze the issues faced by the existing system, and offer methods to improve waste management practices that will provide real benefit to the towns citizens. It is important to keep the human at the center of any improvements.

This research employs a mixed-methods approach, which includes both quantitative and qualitative techniques. The data collection methods include a questionnaire survey and semi-structured interviews with relevant stakeholders, such as municipal authorities, waste collectors, and residents.

The sampling strategy involves purposive sampling of key informants and stratified random sampling of the residents. The data analysis techniques used in this research include descriptive statistics, thematic analysis, and content analysis.

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Federated Learning for Smart Health Care System in Developing Countries

by Karan Gaikwad

To discuss the potential of smart healthcare systems in developing countries and how federated learning can improve their quality and accessibility. Federated learning is a decentralized approach to training machine learning models on data without centralizing the data itself, thus preserving the privacy of individual patients.

The research cites examples of successful federated learning applications, such as predicting hospital readmission rates and early detection of sepsis. The research proposes a study to examine the potential of federated learning as a solution for improving the performance and effectiveness of smart healthcare systems in developing countries.

The study will identify the challenges faced by these systems, evaluate the potential of federated learning to address these challenges, and propose a federated learning framework to improve the performance and effectiveness of these systems. The feasibility and potential impact of the proposed framework will be assessed, and recommendations for future research and implementation will be made.

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Framework for Integration System of Information System for Manufacturing Industries

by Kiran Manwar

Information system of manufacturing industries is very complex and consists of multiple systems like PLM, Supply chain, ERP, etc. There are heavily customised integrations between multiple applications/systems which makes application complex and impacts application performance and user experience. These systems can be in any manufacturing industries such as Automobile, Lighting, Home appliances, etc. These systems need to have the updated information related to product, hence, there is a pressing need of having the most efficient integration system which will ensure the data integrity and provide more efficiency.

This project emphasises the technical challenges PLM and other systems face for data transfer and integration and proposes the framework for most efficient data transfer. The integration system of manufacturing industries have many challenges right from its implementation to data transfer between the systems. For instance, data mismatch in downstream systems, improper data transfer due to improper implementation, data loss due to special characters, etc.

This research aims at proposing the framework of centralized integration system which helps data transfer via integration servers.

Technologies:

Java, JSON, XML, Python

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Animation

Automotive and Automation

CI/CD (Pipeline), Testing, Ops

Cloud Computing

Computer Forensics

Computer Networks

Computer Security

Database and Analytics

Digital Graphic Design

Game Development

Hybrid/Progressive App

Information Systems and Modelling

Internet of Things

Media Development and Production

NDA - Workplace Project

Native Android app

Physical computing (IOT)

Software Development Back End

Software Development Core

Software Development Front End

Software Development Mobile

Testing

Web App

Workplace Project