



UNIVERSITY OF
PLYMOUTH

Computing and Mathematical Sciences

PROJECT SHOWCASE 2020

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School of Engineering, Computing and Mathematics



Introduction

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Head of School
Professor of Ocean Engineering
Director of COAST

Our SECaM Project Showcase celebrates the excellent project work of our students and the diverse range of research and development projects they undertake. It is an opportunity for the students to showcase their work to external visitors from industry, fellow students and members of the academic staff.

The School of Engineering, Computing and Mathematics offers our students the opportunity to study for degrees under six main disciplines: Mathematics, Computing, Mechanical and Marine Engineering, Civil and Coastal Engineering, Electrical, Electronic and Robotics Engineering and Navigation and Maritime Science, the latter being the historical focus of education since the Plymouth School of Navigation was founded in 1862. We aim to serve the educational, research and industrial needs of those living and working in the South West and further afield – our graduates are eminently employable and we are proud of their contributions to society.

The final year projects provide an opportunity to integrate degree topics and transferable skills and demonstrate the ability of a student to work on a significant individual project. Many of the projects are interdisciplinary and a fair number are sourced from industry, often as a result of a placement year in a particular industry.

The information presented in this brochure provides a summary of the projects that will be presented through the Showcase 2020 website. While this brochure does not convey the full extent of the students' activities and achievements, it does provide a means of encapsulating something of their efforts into a permanent record.

So, on behalf of the School of Engineering, Computing and Mathematics I extend a particular welcome to our sponsors from industry and to other members of the public – I hope that you enjoy the website and connecting with the students. These projects are only as good as our ability to explain and promote them and whilst we provide our students with a significant number of opportunities to present and explain their work during their degree programmes, the final year project showcase is the 'pièce de résistance'.

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Projects

CORE COMPUTING PROGRAMMES

BSc (Hons) Computer Science

BSc (Hons) Computing

SPECIALIST COMPUTING PROGRAMMES

BSc (Hons) Computer and Information Security

BSc (Hons) Computer Systems and Networks

BSc (Hons) Computing and Games Development

MATHEMATICS

BSc (Hons) Mathematics

BSc (Hons) Mathematics and Statistics

BSc (Hons) Mathematics with Finance

BSc (Hons) Mathematics with Theoretical Physics

BSc (Hons) Computer Science



TECHNOLOGIES

- Tensor Flow
- Twitter
- Neural Networks
- Python

Automated Sybil Detection Using Neural Networks

Harley Baker

BSc (Hons) Computer Science

The widespread use of online social networking platforms has made them a large target for the spread of misinformation, particularly for groups with agendas they want to push. These groups often use automated accounts that are designed to appear as human as possible in order to fool users, this makes them hard to identify and deal with especially at large scales. My project aims to create an automated system to classify nodes within social networks to aid in the battle against automated bad actors online using neural networks to accurately determine the characteristics of an automated account.



TECHNOLOGIES

- C++
- OpenGL

Food Chain Simulation with Evolving Creatures

Matthew Barnett

BSc (Hons) Computer Science

The goal of this project is to test what traits become dominant in animal food chains depending on their environment. The user can specify what animals are in the simulation and their traits as well as the environment they are in. When the simulation runs animals lose and gain energy by trying to hunt other animals or eating vegetation. They will also reproduce, with a genetic algorithm to determine the traits of the child. As the simulation runs users will be able to investigate what traits become dominant in animals depending on their environment, prey and predators.



TECHNOLOGIES

- ASP.NET MVC
- Javascript
- HTML
- CSS
- Bootstrap
- Ace.js

Codeo – A Dojo-Based Programming Learning Platform

Andrew Devin Bellas

BSc (Hons) Computer Science

Codeo is a web-based code dojo, designed to facilitate and support the learning of programming. Users are able to work through code problems, as well as use a chat feature where they can find support for problems with their colleagues, in order to create a web-based abstraction of a typical code dojo. Users are able to write solutions to problems in a language, and submit this for automated judging via a suite of tests, which give high-level feedback on what a user has done right or wrong, in order to guide them as to what can be done to better improve their submission.



Supermarket Stock Management and Replenishment System

TECHNOLOGIES

- ASP.NET
- Java
- SQL Server
- Android Studio
- Visual Studio

Rhys Bower

BSc (Hons) Computer Science

This project allows supermarket staff to complete their jobs with the help of technology, while providing managers with information about staff performance. The system consists of a mobile application and a web-based application. The mobile application is used by staff to receive deliveries, breakdown deliveries, replenish deliveries, enquire about products, edit the stock of a product and dispose of products. The web-based application is used by managers to monitor staff performance, place orders, manage stock and view daily/weekly figures on stock replenishment and inventory levels.



Drinks Buddy – Club Night Out Companion App

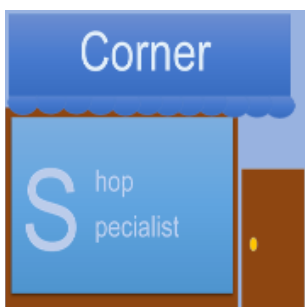
TECHNOLOGIES

- Flutter/Dart
- Firebase
- Google Maps API
- Android SDK
- IOS

Thomas Joseph Broughton

BSc (Hons) Computer Science

'Drinks Buddy' aims to make nights out safer for groups and, in doing so, addresses issues observed in UK club culture. A group-tracking feature is one way in which the app pursues this goal; group members will be able to stay updated on their friend's locations through a live map, reducing the risk of friends becoming isolated. 'Drinks Buddy' will also feature a drinks tracker that can update a user on their personalised alcohol intake. This will be coupled with information about safe drinking from validated sources such as Drink Aware, personalised in a similar manner to the drinks tracker. Finally, a drinks diary will take information from the drinks tracker to present a history of alcohol intake over time.



CSS: Corner Shop Specialist – A Shop Management System

TECHNOLOGIES

- JavaScript
- C#
- HTML
- Node.js
- MongoDB
- Express

William Butler

BSc (Hons) Computer Science

Many corner shops are still using very outdated systems running on out of date operating systems making them less secure in an ever-evolving security world. CSS is a shop management system designed to allow shop staff and customers to more easily interact with corner shops and make running a shop easier. It provides features to manage staff, customers, stock, deliveries and news rounds. The CSS approach provides users with a modernised solution that runs on the latest software and runs industry standard security.



TECHNOLOGIES

- Raspberry Pi
- Python
- OpenCV

Self-Driving Raspberry Pi Car

Vincent Castellani

BSc (Hons) Computer Science

This project is a self-driving car that uses the Raspberry Pi for computational processing. The aim was to build a two wheeled car that uses the Raspberry Pi to process lane detection and keep the car moving within the given lane boundary. The car will take information from two main sources which are the PiCamera and ultrasonic sensor. Using real-time footage from the PiCamera, the RPi will process the video frame by frame and detect the lane lines. The ultrasonic sensor will monitor and measure the distance of objects in front of the car and stop it once it is within a predefined range.



TECHNOLOGIES

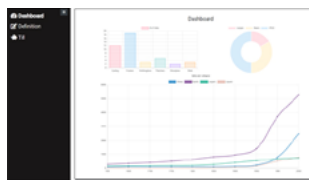
- Python
- Linux
- ARM Processors

Parallel Machine Learning on an ARM Grid

Erin Clifton

BSc (Hons) Computer Science

This project aims to explore the use of low cost, low energy microprocessors in machine learning and other parallel tasks, such as K-Means, K-NN Clustering and matrix Multiplication. By utilising several python libraries, parallel tasks can be executed on remote devices to speed up computation. The main appeals of using such boards are their low cost and extremely low power draw.



Till and Management System

TECHNOLOGIES

- Java
- Spring
- OpenAPI
- Angular
- PostgreSQL

Till and Management System

Samuel Collis

BSc (Hons) Computer Science

This project is a system aimed towards smaller businesses and providing an easily maintainable point of sales application. The application allows for the creation/ modification of till screens for employees to use as well as a dashboard system that can provide insights on previous sells through various graphs. The application is a single self-contained jar file that utilises Liquibase to create the required database tables. This approach ensures that the system has little requirement in place for the system to work, ensuring simplicity for business owners.



TECHNOLOGIES

- Python
- OpenAI Gym
- PyTorch
- PyTest
- Valohai
- Azure

Automated Decisions – ML Privacy and Generality Bounds

Aidan Connelly

BSc (Hons) Computer Science

In this project, we evaluate machine learning algorithms which are robust against changes in the inclusion or exclusion of datapoints in their training data. Robustness against these changes is known as differential privacy, a field that aims to protect user data from being reverse engineered. Our main contribution is the first evaluation of differentially private algorithms on the most common reinforcement learning task, the Atari Learning Environment. The bounds on the strength of the differential privacy we identify can aid further research.



TECHNOLOGIES

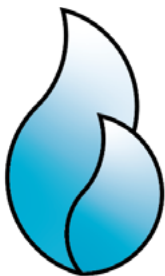
- Python
- Node.js
- React
- TensorFlow
- Kubernetes
- MongoDB

Energy Future – Renewable Energy Forecasting

George Downer

BSc (Hons) Computer Science

The advancement of renewable technologies has seen the UK less reliant on conventional electricity production methods. However, a major problem with renewables is their dependence on natural forces. Energy Future aims at producing a forecast of renewable energy technologies to allow optimal usage of the UK's green energy. Energy Future can be accessed through a web interface for making energy usage decisions manually or through an API for integrated IOT devices to consume. The application is built to scale to meet consumer demand with auto recovery.



TECHNOLOGIES

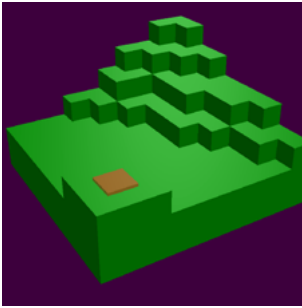
- Android Studio
- Java
- XML
- JSON
- Google Firebase

Cookery

Jordan Downs

BSc (Hons) Computer Science

Cookery is an android application where users can create recipes according to a template of steps. This results in a step by step recipe for another user to view. The app doubles as a social media platform – the overall aim of Cookery is to bring people together by cooking. The target audience is Chefs and people who like experimenting with food, such as vegans and vegetarians, they can share what they have learned with others and view/comment on each other's dishes. The quality of content in the app will be up to the users – and rating the recipe once they have completed it – this will sort the dishes into popularity and if a recipe receives consistently low ratings it will be removed from the app.



TECHNOLOGIES

- Node.js
- Express.js
- Three.js
- JQuery
- Socket.IO
- MongoDB

3D Map Management Tool for Table Top Games/3D&D

Reece Drage

BSc (Hons) Computer Science

A map management tool to design and distribute grid-based table top role-playing game maps with height values, displaying them to game-masters and players in 3D for a more immersive view. The tool will allow for map design as well as active session hosting, allowing players to move characters around the designed map and providing functionality like tracking movement distance, displaying descriptions of specific tiles and allowing for sections of the map to be dynamically hidden and revealed to players.



TECHNOLOGIES

- Node.js
- Python
- TensorFlow
- Google Cloud Services

Captions for Gaming

Adam Edwards

BSc (Hons) Computer Science

This program aims to provide close to real time captions for a voice chat while gaming. Voice chat is popular in gaming as it allows for fast communication of information - but what if you can't hear it? This program uses machine learning to provide a speech to text service to allow deaf players to understand their teammates faster than typing information. It is built wrapped around an existing voice chat application to allow multiple users to speak at once and no information is lost.



TECHNOLOGIES

- Ionic Mobile
- Angular/Typescript
- C#
- .NET Core 3.1
- Microsoft SQL Server (T-SQL)
- Unity, HTC Vive

Locus

Evan Edwards

BSc (Hons) Computer Science

Locus is a mobile app paired with virtual reality that expands the viewing and analysis of location data by enabling people to view their location history in three dimensions. Cross-platform support enabled by TypeScript on the ionic platform allows users to map their commute, road trip or hike, then view their position history, including altitude, in a three dimensional interactive environment. Developed for concurrent systems, data is hosted in the cloud to manage synchronisation between multiple mobile and VR clients. Each client is loosely coupled together to remain flexible and empower users.



TECHNOLOGIES

- Azure SQL DB
- C# and JavaScript
- ASP.net framework AP
- P5.js library for visual audio design

MySound (Open Audio Platform)

Ned Fellenor

BSc (Hons) Computer Science

The MySound project aims to produce an Open Audio Platform that effectively allows users to share audio and increase their following through communicating with others. The final product will include a web and desktop application which will contain exclusive features such as customizable audio visualisation. Current Open Audio Platforms such as SoundCloud lack features or include unnecessary components. This product will be distinct from these as the identified missing features have been considered and will be implemented, creating the ultimate Open Audio Platform.



TECHNOLOGIES

- Java
- JavaFX
- TensorFlow
- IntelliJ

Intelligent Data Mapping and Cleansing of ICU Physiotherapy Data

Ashley Foster

BSc (Hons) Computer Science

This project is solving the problem of unstandardised datasets for ICU physiotherapy data in collaboration with Derriford Hospital's #RehabLegends campaign, in the effort to map the data to a standardised data structure and cleanse the data as best possible. This would open the gates for collaboration between hospitals with the aim to allow detailed analysis of the effects of physiotherapy within ICU. The system will allow the mapping and cleansing of data and allow the browsing and interrogation of the processed data and export of cleansed data in a number of formats.



TECHNOLOGIES

- Java
- Microsoft SQL Server
- HTML
- JavaScript

SAME – Student Attendance Made Easier

Harry Fresco

BSc (Hons) Computer Science

This student attendance system is made to increase the efficiency of registering a student's attendance in a school or university scenario. It consists of a Java Desktop program that the teacher can sign students in without the use of their student card. Overall attendance can be viewed along with student's individual statistics. The system also consists of a website where the students can view their own current attendance. The fact that the students can monitor their own performance may increase the student's effort to attend all classes/lectures in order to achieve higher attendance.



MoodSage

TECHNOLOGIES

- Android
- Kotlin
- Angular
- Node.js
- MongoDB
- Heroku



TECHNOLOGIES

- Google Cloud
- Javascript
- HTML
- CSS
- Bootstrap



TECHNOLOGIES

- Typescript
- React
- Electron
- Rust
- Docker

MoodSage

Edward Gavin

BSc (Hons) Computer Science

MoodSage is an application targeted at people dealing with anxiety and depression. It allows the user to keep track of their moods, thoughts and worries, it will give them the ability to look back on these at any point and see statistics on the data that they have put in so that they can better track their progress. If a user is also in therapy MoodSage provides an application that therapists can use. This allows users to link their account with their therapist so that the therapist can help keep track of what the user enters and can use that information during therapy sessions.

Sumphive Chronicle

Adam Gilbert

BSc (Hons) Computer Science

Sumphive chronicle is a dynamic browser-based web application designed to facilitate the play of Table top games. Providing users with a range of specific tools on their devices, as well as custom quick reference materials, they are able to replace a bulky and awkward paper system with common mobile devices. By using a cloud-based system, Sumphive chronicle can ensure scalability and potential future expansion of scope.

GPS Coverage Prediction Utility

Adam Gleave

BSc (Hons) Computer Science

This utility allows the user to determine predicted GPS service coverage across an area anywhere in the world for any point in time. Through the distributed orchestration of simulator hardware, a 3D coverage map will be generated faster than real-time. Tests can last for hours or days, and can be navigated through to determine optimum coverage times and routes for technologies such as delivery drones. The back-end orchestration code is written in Rust and is multi-threaded for optimum performance and the Typescript/React UI provides a simple web interface for the customisation of tests.



Computer Vision Wall Painting Mobile App

Oliver Gregory

BSc (Hons) Computer Science

With this app the user is able to apply a chosen colour to a selected wall using their phones camera to display the room. This is achieved using edge detection to identify the walls then using a filling algorithm to fill the selected wall with the selected colour. The development of this project is focused on implementing various edge detection algorithms and image filters, then comparing the results to find the most suitable for this problem field, multiple metrics will be considered including performance on mobile devices and quality of the edges in various lighting conditions.

TECHNOLOGIES

- Renderscript
- Android
- GPU Parallelised Image Processing (Edge Detection, Image Filters and Flood Fill)
- Kotlin



Gaming Community Organiser

Christopher Groutage

BSc (Hons) Computer Science

Gaming Community Organiser (GCOrg) aims to provide a unified organisational platform for online gaming communities. A community can have public and private calendars to plan and organise events as well as general tasks that community members have to complete. GCOrg also features a custom data store component allowing communities to store data that is specific to them on the platform, this helps to unify the data storage for an online community. The applications' ultimate goal is to provide a platform that is specifically targeted towards the needs of online gaming communities rather than existing solutions such as Trello and Asana, which are geared more towards business use.

TECHNOLOGIES

- MongoDB
- Express
- React
- Node.js
- Passport
- JSON Web Tokens



Rico Assistant (Recommendation AI)

Billy Haggar

BSc (Hons) Computer Science

Rico suggests items best matched to user interests, saving the need to search and browse items of no interest. It uses an AI machine learning algorithm that categorises, you the user, through a few simple questions. Rico will recommend items from a selection of areas such as movies to watch, activities to do, and plans recommended treatments to medical patients. Rico is a reactive web application accessible by all devices, tested with TDD techniques to ensure a fully working application. The algorithm will be tested/prototyped with industry data science techniques in Python/MATLAB.

TECHNOLOGIES

- MEAN/MERN Stack
- Travis CI
- HTML, CSS, Bootstrap
- TensorFlowJS
- Python/MATLAB (Prototyping) – JQuery



Web Application Document Manager

Yuxuan Han

BSc (Hons) Computer Science

The University currently manages course documentation by means of SharePoint and Word templates. Maintaining such documentation is troublesome, as format and content cannot be edited separately. Thus, my project will create an alternative document management system, consisting of a web application and document editing facilities, where the format of documents will be modifiable without affecting the contents. My system will allow for multiple people to participate in the writing of a document, and a timeline of editing actions (replace, delete and add) will be kept for each document.

TECHNOLOGIES

- MySQL
- PHP
- Google Cloud
- WordPress
- Visual Studio



Superf.dev – Web Performance Auditor

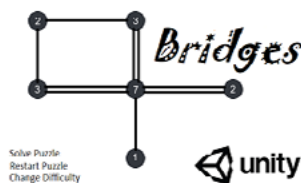
Rhys Hellyar

BSc (Hons) Computer Science

This project will enable developers to gather metrics with regards to the size, performance and accessibility of their web apps, with a focus on delivering fast applications to areas of the world with less advanced infrastructure and technology. Web developers will maintain a list of websites they wish to monitor, fire new audits both manually and automatically, and view previous audit results. The auditor is designed to run on the AWS Lambda service, which will allow on-demand audits to be carried out for the user, with no need to queue requests, and will provide results to the user in real time.

TECHNOLOGIES

- Node.js
- MongoDB
- AWS Lambda
- React
- Heroku
- TravisCI



Bridges

Theodoros Herodotou

BSc (Hons) Computer Science

This project is a remake of an old puzzle game called Hashiwokakero which is implemented in Unity. The user has to connect the islands rendered with bridges to solve the puzzle following some simple rules. This project will enable the user to choose and between various difficulties based on what they want to achieve. The user will be able to see how much time they spent solving each one of the puzzles. This project will allow the users to have fun and sharpen their minds by solving varying difficulty puzzle games.

TECHNOLOGIES

- Unity
- Visual Studio
- C#



TECHNOLOGIES

- Firebase
- Android Studio
- MobileNet
- Python
- OpenCV Image Library
- TensorFlow

Object Detection for Bouldering Holds

Jack Hewson

BSc (Hons) Computer Science

This project involves a trained model using the TensorFlow toolkit and the MobileNet neural network to initially detect seven different bouldering holds. Using the Android application, users can use their camera to learn the names of the holds in real-time via AR. Users can also give feedback on the success of the labelling; they can label holds that were not detected and rename incorrectly named holds. Using Firebase, the model is hosted and retrained using user's feedback to continuously improve the model. This also means the application needn't be updated every time the model is updated.



TECHNOLOGIES

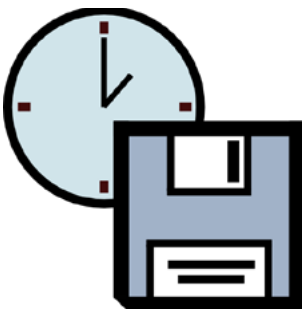
- MySQL
- PHP
- Flutter
- Google Cloud Platform

Reading Log

Chloe Hobbs

BSc (Hons) Computer Science

Teachers will be able to add children to the system, monitor reading progress, be notified when a child is due a reading test (so they can be moved up to the appropriate reading level) and set rewards for the child to meet (making the child more enthusiastic about reading). They will also be notified when a child has not read, so they can intervene before the child has fallen behind. Parents will be able to view their child's progress, add when the child has read (choosing from a drop-down list of books at the right reading level or add their own book and for independent reading) and leave comments for the teacher to see. Parents can see the targets and if their child has met them.



TECHNOLOGIES

- C#
- Json.NET
- Node
- HTML
- CSS
- JavaScript

Data Backup Manager

Alexander Humphrey

BSc (Hons) Computer Science

This software will allow a user to set up regular cycles to carry out backups of data locally. They may be singular one-offs or regularly scheduled. The user will have the option to upload their files to Google Drive also. An accompanying website will allow a user to view cycles that have been completed as well as upcoming ones. There is also the possibility further down the line that this website will have some control over the desktop application.



TECHNOLOGIES

- Postgresql
- PostGIS
- Node.js
- React
- Leaflet

South Hams District Council Asset Checker

Jacob Irwin

BSc (Hons) Computer Science

The council has a huge number of trees under its jurisdiction, each of which needs to be audited and checked on a regular basis for insurance purposes. This system will leverage a completely open source stack of technologies (Postgresql & PostGIS, Node.js, React and Leaflet) to make a simple yet powerful cross-platform web interface for inspectors to audit and add these trees with. This will streamline the whole documentation lifecycle and solidify the paper trail needed when handling insurance claims. Trees, being the showcase example, can be replaced with anything that needs mapping and checking.



TECHNOLOGIES

- JavaFX
- Oracle 19c Database
- SQL Database Manager
- Block Chaining
- AES Encryption
- Distributed Ledgers

Clear Vision – Data Mining and Visualisation

Joshua Jones

BSc (Hons) Computer Science

Clear vision is a data extrapolation application that employs existing data visualisation and mining techniques for use with quantitative and qualitative datasets. A wide range of charts with comprehensive visualisation modification, presenting data in a custom format and style. Tried and tested data mining functionality provide for an in-depth perspective of trends, correlations and patterns. Purpose built for small and medium size datasets and applicable for a range of data types. Data mining tools include; classification, clustering, association rule, outlier detection, regression and sequence mining. Fully GDPR compliant with integrated AES 256-bit encryption, purpose block chaining, distributed ledgers and record integrity validation. Exceeding data protection act requirements for security.



TECHNOLOGIES

- HTML
- CSS
- JavaScript
- Node.js
- MongoDB
- Express

Code Companion

Jack Lay

BSc (Hons) Computer Science

Code Companion is an educational application intended to teach coding to beginners. It is aimed at both independent learners and those in education, with features including teacher tracking and assignments alongside learning tasks which can be completed at any time.



BudgetMe

TECHNOLOGIES

- Kotlin
- Android Studio & ADT
- Android SDK

BudgetMe

Dan Malecki

BSc (Hons) Computer Science

BudgetMe is a money management and budgeting application for android that allows users to track their finances and control their spending. Users can record income and expense transactions and BudgetMe will update the displayed balances of multiple bank accounts. Automatically generated reports show users information such as their expenses and income over a given period of time, and a category system provides users with the ability to record and view transactions by type. Spending goals help users control their expenses by providing up-to-date graphs and alerts as they add transactions.



TECHNOLOGIES

- C++
- Kotlin
- Java
- OpenCV
- Git
- Android Studio

Lifting Path

Leonardo Martinez Solarte

BSc (Hons) Computer Science

Lifting Path is an android application used to track the path of a bar for compound lifts, such as squat, bench press or deadlift. The user can either record a new video or select an existing one of them performing an exercise while being perpendicular to the camera to view the bar trajectory. The main goal of this app is to help lifters improve their form as technique is the strongest factor when it comes to achieving new records.



TECHNOLOGIES

- Ruby on Rails
- PostgreSQL
- Heroku
- HTML
- CSS
- Devise

Loracle

Troy Matthews

BSc (Hons) Computer Science

Loracle is a web-based information storage tool for writers. It was developed to assist writers in world building and timeline management. Encapsulating and navigating information is the cornerstone of this project so an intuitive UI will be present to the user. A robust database manages the information that was designed around the idea that different writers would wish to store information into different categories. Writers create amazing worlds and stories. This information is often too vast to quickly reference, and it is for that scenario that Loracle was created.



TECHNOLOGIES

- C
- C++
- C#
- Windows API
- Windows Driver Kit (WDK)

Windows Elevation of Privilege Sensors (WINEOPS)

Conor McErlane

BSc (Hons) Computer Science

WINEOPS is a security research tool that helps researchers discover elevation of privilege vulnerabilities in Windows software. In early stages of development, it has already been used to find multiple Windows 10 zero-days. A kernel driver is used to monitor I/O performed by privileged processes. Information is passed to a user-mode component which determines if the operations are potentially vulnerable. WINEOPS can detect multiple vulnerability classes including file system race conditions, DLL hijacking and named pipe squatting.



LANE DETECT

TECHNOLOGIES

- Python
- PyCharm
- Anaconda
- Open CV
- Docker

Lane Detection for Cars from a Dashcam

Ajibode Oluwatimilehin Oluwatosin

BSc (Hons) Computer Science

The name implies the project aim which is to detect lane lines to aid with the concept of driving and lane discipline. This will be used to detect lanes on highways irrespective of curvature. The project involves using layers of several image processing algorithms and NumPy array manipulation to detect lanes. The input source continuously takes in the video which is then processed. It uses Open CV large array of image processing algorithm to carry out functions such as undistortion, transform, warp etc. The output is an overlay of automatically generated lines from the program on the initially read input. This application supports young and potential drivers with the rigors of understanding a useful skill when learning to drive.



TECHNOLOGIES

- TensorFlow
- Keras
- Android Smartphone

Audio Classification using Neural Networks

Matthew Pinkerton

BSc (Hons) Computer Science

When I started learning how to dance, each dance event rapidly moved between the styles of music playing, making it difficult to immediately identify what style of dance was preferred for the song. Due to this delay, I often ended up missing out on dances as the dance floor quickly filled up in the time it took me to understand what style of dance I needed to perform. My project: an android app which works similarly to audio identification technologies (Apple Siri), which will listen to the song playing in real time and give the user a suggestion for the style of dance best suited to the song.



Swell Surf Check

Emily Potter

BSc (Hons) Computer Science

Swell Surf Check is a website and mobile application that allows surfers and tourists around the South West to check the surf conditions at nearby beaches. For those who want a quick and easy forecast, there is an artificial intelligence chat bot that can be used to check the surf at a specific spot which instantly returns a description of the conditions. For those who do not know exactly what they are looking for, each surf spot has a detail page which incorporates Google Maps and uses the Google Places API to get nearby points of interest with reviews and pictures.

TECHNOLOGIES

- Angular
- Ionic
- MongoDB
- AWS Lambda
- Dialogflow



TECHNOLOGIES

- C#
- Asp.net
- React
- SQL Server
- Microsoft Bot Framework

Physiotherapist Outpatient Exercise Hub

Nicholas Simon Rawlings

BSc (Hons) Computer Science

The aim of the project is to create a system where physiotherapist staff can create and update exercises. Then assign them to a patient who can then see what exercises they have assigned to them and information about them. The admin will be able to assign staff to patients so that only staff assigned to patients can interact with the patients. Patients will be able to login and view their exercises and find out more about their injuries and treatments. A chat bot interface will be included and allow the patient to get more information on treatment through a QnA system integrated into it.



Study Assist – Student Life Helper App

Shannon Rice

BSc (Hons) Computer Science

Study assist is a mobile application designed to help students with the day-to-day management of their university experience. The application has a wide range of features to ease the stress of student life. The app allows users to import their student information and data so they can be easily accessed and managed on their phone. This data includes their student ID/barcode, timetable and financial information. This data is stored in a database and used to view their budgets and deadlines, setup reminders and generate a study timetable to help keep them on track with their degree.

TECHNOLOGIES

- Flutter/Dart
- Firebase
- GitHub
- VsCode
- JSON



TECHNOLOGIES

- Java
- HTML
- JavaScript
- C#
- SQL

Holiday Park Management System

Ross Scadding

BSc (Hons) Computer Science

This application is based on managing the operation of a holiday park. A holiday park can have many different types of available accommodation and with that becomes a varying range of prices. Bookings must be continually analysed to allow accommodation to be ready when needed therefore cleaning and other maintenance work must be planned and completed in the allotted time frame between customer change overs. Customers must also have multiple ways to book to suit their needs. Being able to book on the website as well is also important because customers can find the holiday park for the first time via sites such as Tripadvisor or by other promotional content.



TECHNOLOGIES

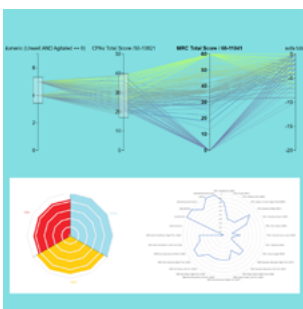
- MySQL
- Xamarin (xaml/C#)
- Android
- ASP.NET

Stokk (Integrated Home Database)

Struan Sharpe

BSc (Hons) Computer Science

Stokk is an integrated home database application designed to make shopping, cooking and keeping stock easier. The user has freedom in customisation of the database allowing them to add rooms and storage spaces on the fly. The application can also be used as a shopping list, which the system writes, and the user can add to and check when not at home. The application shows the collection of meals a user can make with their current ingredients in home. All these parts within one application, so the most up-to-date information is always available.



TECHNOLOGIES

- JavaScript
- Azure
- Node.js
- Jenkins
- ASP.net
- SQL

ICU Patient Data Information Visualization

Ryan Daniel Sheehan

BSc (Hons) Computer Science

The ICU at Derriford Hospital is responsible patients that are seriously ill and generally require major organ support. The focus of the project is to provide the therapist staff, currently working at Derriford Hospital the ability to visualise their data that has been collected. This will be achieved using the analysis of big data and different visualisation/visual analytics techniques. The visualisation of this data will hopefully lend to insights that may not have been readily apparent, and the final product will be a result of feedback and requirements fed back from medical staff.



TECHNOLOGIES

- React Native
- Firebase
- Visual Studio Code
- JSON
- Node
- GitHub

Mobile Tracker App for Patients in Intensive Care

Steven Sheekey

BSc (Hons) Computer Science

The tracker mobile app for patients in intensive care has a main aim to help patients get through the Intensive Care Unit (ICU). The main purpose is to try and reduce the amount of time patients spend in the ICU as treatment costs the NHS £2000 per patient per day. Other aims are to track patient progress, remind patients to do their exercises assigned to them by their physio therapists, and to make their stay in ICU a little better by allowing them to load meaningful photos directly to the app. This has been shown to help with delirium which is common within patients that experience the ICU.



TECHNOLOGIES

- Java
- Microsoft SQL Server
- Mapbox
- WebSockets

Holla – Localised Instant Messaging App

Michael Stanford

BSc (Hons) Computer Science

This app is designed to allow people nearby to message each other in localised chatrooms. In a society which is becoming more reliant on phones people are less likely to interact with those around them. This app aims to solve this issue by allowing users to talk to others close by without the anxiety and awkwardness of face-to-face contact. The app shows the location of different chats overlaid on a map with users able to join chats if they are close by. Users are also able to create their own chats for others to join with customisation options such as the joinable radius, maximum number of users and a password.



TECHNOLOGIES

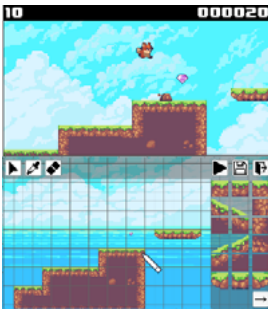
- OpenGL
- C++

Mod3D

Alec Stroemer

BSc (Hons) Computer Science

Mod3D is a 3D modelling engine designed to help get those less experienced with 3D design into creating objects of their own. Mod3D is an object-based modelling system based around combining multiple objects together into complete objects. Its simple design compared to other existing 3D modelling software solutions makes it suitable for those wishing to design their own models.



TECHNOLOGIES

- Unity
- C#
- Node.js
- Docker
- MongoDB



CloudPT

TECHNOLOGIES

- MongoDB
- Express
- ReactJS
- Node.js
- Heroku



TECHNOLOGIES

- VueJS
- Express.js
- GraphQL
- Neo4j
- Node.js
- Docker

Full Stack – 2D Platformer Game with Level Builder

Sonny Taylor

BSc (Hons) Computer Science

A full stack application, integrating a game created using Unity written in C#, with a Node.js API. It allows users to create, upload and download levels from a database. The game includes a level builder that even contains functionality to use custom made and uploaded assets. Users can search for, play and download levels – filtering their search to match certain criteria. It's been built for people who are interested in 2D game design but don't have coding knowledge, it also appeals to people who aren't interested in game design but want to play unique platformer levels.

CloudPT – Personal Training Management System

Daniel Thick

BSc (Hons) Computer Science

CloudPT is a progressive web application designed to improve communication between personal trainers and their online clients. Using a client management system personal trainers can view client's progress and workout history. They can create and assign workouts to specific clients and instant message them. Clients can view assigned workouts and input details about completed workouts. They can track their weight and view their progress across exercises as well as instant message their personal trainer. CloudPT has been developed with JavaScript using the MERN stack. Web sockets have been used to allow for communication between clients and it is being deployed via Heroku.

Caţulam

Timmy Thomas

BSc (Hons) Computer Science

Caţulam is a new approach to tackle problems faced by users of traditional issue tracking software. This browser-based application aims to rethink the user experience of agile project management software and deliver an intuitive UI that prioritizes rich visual organization. It features a faster and more effective issue tracking board which enables developers to spend less time organizing Tickets/issues and more time coding! The web app features agile specific tools to aid stand-ups, retros, sprint planning, backlog management, etc.

WebDev

TECHNOLOGIES

- HTML
- JavaScript
- Node
- Mocha
- Chai

WebDev

Dan Tierney

BSc (Hons) Computer Science

WebDev is a website aimed at helping people to learn web-based technologies. When using the website the user will have options to test what they have learned. At this point, code written on the website will be run against a unit test, with full feedback given to the user. It walks the users through creating basic websites, and working their way through more complex designs and ideas. The design of the “lessons” will be a result of research done into good teaching principals.



TECHNOLOGIES

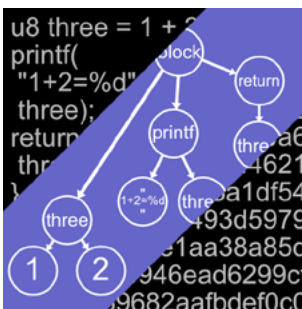
- ASP.NET Framework
- Microsoft SQL Server

Competitive Pokémon Team Planner (8th-Generation Games)

Oliver Tjornelund

BSc (Hons) Computer Science

This application will be an all-in-one planning tool for competitive Pokémon battle teams within the series 8th-Generation of video games. It is intended to allow existing players of the competitive metagame to easily plan competitively-viable Pokémon teams, customising them according to the actual rules and internal mechanics of the video games. It will minimise the time and additional research needed by combining key information (e.g. moves and abilities) and tools (e.g. stat calculation) from previously disparate sources into a consolidated space. It will calculate (in real-time) useful statistics for both individual Pokémon and entire teams (e.g. team-wide cumulative type coverage).



TECHNOLOGIES

- C++
- CMake
- OpenGL

Compiler with Visualisation of Data Transformations

Callum Todd

BSc (Hons) Computer Science

Compilers are often seen as a dauntingly complex process that many developers wave away as a magic black box. This project aims to produce a functioning compiler that, in addition to transforming the source code into assembly, will also visually display the internal data transformations that are taking place to produce the final result. For those who wish to understand more about how compilers function, this has the use case of providing an overview that can be seen as an introduction to their further research. Think of this being used as a demo in the first lecture of a 'Compilers 101' course.



TECHNOLOGIES

- Unity 3D
- Visual Studio C#
- Blender
- Adobe Photoshop
- GitHub



TECHNOLOGIES

- Python
- Raspberry Pi
- JQuery
- Node.js
- Heroku
- MongoDB



TECHNOLOGIES

- Flutter
- Dart
- Firebase Platform
- Xcode
- Node.js

Shattered

Luis Tome

BSc (Hons) Computer Science

Shattered is a short story driven Escape Room style video game where the player finds themselves in an abandoned house and must solve puzzles as they delve deeper into the house and begin to uncover the secrets of the family who once inhabited it. The game is played in first person perspective and the intention is to create a more immersive experience than the traditional point-and-click Escape Room video games. This project is made in Unity 3D, and most of the assets used are free assets obtained from the Unity Asset Store.

Surveillance System

Jason Tungay

BSc (Hons) Computer Science

This is a security system consisting of a three-tier-architecture. A user can create an account and login on a camera device. This device detects motion through an infrared sensor, sound by a microphone and will then send images and/or videos to a Heroku server and any metadata to a MongoDB collection. The user will be alerted if the camera captures and the user can then view any captures via a web app. This system can also be used for capturing birds at a bird feeder or any animals on the ground. If there is no internet connection, the images will be stored on the device in an SD card.

Collections – Home Inventory App

James Webber

BSc (Hons) Computer Science

Collections is a mobile phone application that enables a user to store their collections/ possessions (Stamps, Coins, Memorabilia) in an organised and structured way. Many people have things that they collect but don't know the extent of that collection or have any information to hand. The app uses the phones in-built camera to save an image(s) of any item with associated text, combining the functionality of the photo album and notes apps. Developed with Flutter to give the flexibility to publish to iOS and Android devices from the same code base and integrated with Google Firebase for cloud storage.



TECHNOLOGIES

- Microsoft Azure
- Asp.Net
- Microsoft SQL Database
- HTML and CSS
- Javascript
- JQuery

On-Line Materials to Support Learning Computational Thinking

Alice Wigmore

BSc (Hons) Computer Science

The aim of this project is to develop an interactive tool to support students aged 9-11 as they learn how to create computer code. The tool design will embed pedagogic theory and exploit interactivity. The learning tool will allow users to progress through lessons at their own pace with minimal external support and could be used independently or within a code club. Progression will be tracked and concepts taken from game theory, such as collecting rewards, will be used to assist in motivating users.



TECHNOLOGIES

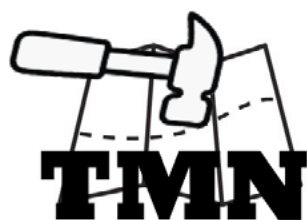
- Microsoft SQL Server
- HTML, JavaScript
- CSS, Postman
- GitHub
- React
- Entity Framework 6

Computer Science Programming Homework Application

Suzanna Williams

BSc (Hons) Computer Science

This program tests the hypothesis that a web-based homework application can help students learn how to program more effectively. The homework application will allow for students to be set exercises by lecturers and receive instant automated feedback on their work which should help promote understanding. It will also allow lecturers to assign exercises to students and receive feedback on their courses with problem topics being highlighted for them so they can alter their teaching to fix those problems students are struggling with. This app aims to engage students and help improve their skills.



TECHNOLOGIES

- Node.js
- Typescript
- Angular 9
- Firebase
- CircleCI
- Socket.IO

TRADEWORK.NET – Traders in your Neighbourhood

Joe Wood

BSc (Hons) Computer Science

TRADEWORK.NET is an application that leverages the accessibility gains shown in applications such as Uber and Airbnb and applies it to the field of DIY and trading. Using google maps integration to provide a network of local traders and available jobs for those traders to accept or decline, allowing for an end-to-end interaction with chat, payment, posting of jobs, accepting of jobs and tracking completion. With key interaction being based on review scores for both traders and consumers. The aim being to provide an accessible single application to allow for all kinds of trade work from cleaning to construction to be catered for.



TECHNOLOGIES

- Node.js
- Bootstrap
- MongoDB
- Express
- Raspberry Pi
- JavaScript



funghifinder

TECHNOLOGIES

- Swift
- Sql
- Google Cloud Platform
- PHP

Manufacturing Management System

Theodore Woodward

BSc (Hons) Computer Science

Efficient production is key to profitability in manufacturing sites. This manufacturing management system helps optimise production lines by providing dashboards and insight across product lines, allowing managers to gain a bird's eye overview of the processes taking place in their factory. Data is gathered both manually using an interface to input data, and automatically using sensors to confirm batches of product that have been produced. Dashboards the system provides then provide managers with informative access to this data so that product lines can be synchronised to increase profitability.

Funghifinder

Yasmin Yearoo

BSc (Hons) Computer Science

Funghifinder is an app to allow you to record your mycological finds. Offering you the ability to search through the most common species of mushroom and a detailed description of each one to make identification easier whilst on the go. Enabling you to record every mushroom you find with their identifiable features, the GPS coordinates of where they are found, and the date you found them. Making it easier to find them again next season. View your finds on a map and share your finds with others. Collate and analyse the weather data of when you find the mushrooms to help you predict when the mushrooms may appear next.

BSc (Hons) Computing



Ez Tracker

TECHNOLOGIES

- Node.js
- Vue
- Express
- Morgan
- Nodemon

Ez Tracker

Logan Atkinson

BSc (Hons) Computing

Ez Tracker provides a detailed insight into your online video game statistics. With a wide variety of games to choose from, Ez Tracker allows you to simply select a game, enter a player ID/gamer tag and immediately view that player's in-game statistics. These stats are clearly displayed through both text and graphics and where applicable, these stats can be manipulated to give you a better understanding in to how you play your own games.



TECHNOLOGIES

- Javascript
- JQuery
- MySQL
- SSM
- Tomcat

Online Car Rental Management System

Ruifeng Bai

BSc (Hons) Computing

The car rental management system is an online motor vehicle rental management system that has risen since the emergence of taxis. The car rental management system can allow idle vehicles to maximize their use efficiency, realise resource sharing, improve social resource use efficiency, and increase residents' income. It is a great gospel for car owners, and it is also beneficial to car users. This system covers a series of functions required by a car rental management system such as multi-user management, vehicle editing, query statistics, log management and authority management.

S2T

TECHNOLOGIES

- PHP
- Ajaxs
- Bootstrap
- Html
- Mysql
- Uwamp

S2T

Jon Barton

BSc (Hons) Computing

In the 21st century there are many ways to communicate and many different places for study tutors to organise their students. However this web application will be all in one, this ensures that companies like Amano allow study tutors to have more freedom as there no communication from the company booking team and the study tutor. This allows students and study tutors to book sessions as either one can easily forget when the next meeting is, this saves the awkward texts are we sending today.



TECHNOLOGIES

- ASP.NET
- HTML
- CSS
- JS
- C#
- SQL Server



TECHNOLOGIES

- React-Native
- Node.js
- Firebase
- JavaScript
- JSON
- Visual Studio Code



TECHNOLOGIES

- ASP.NET MVC
- HTML, CSS
- JavaScript
- C++, C#
- Bootstrap
- MySQL

The Basics of Programming

Ethan Ray Bridgett

BSc (Hons) Computing

I am creating an application to be used primarily by first year students that will help teach them the fundamentals of programming. My goal is for this software to be used by students during their lab sessions, allow them to complete certain tasks which will teach different functionalities from multiple languages including HTML, CSS and C#. My application will also have the ability to collect feedback from each course and feed it to their lecturer anonymously, to help inform the lecturer of any sections of the practicals that the students do not understand, so they can go into more detail during the next lectures.

NHS Rehabilitation Planner

Nathan Brock

BSc (Hons) Computing

Written with React-Native, the NHS Rehabilitation Planner is a mobile app, for both Android and iOS, which allows NHS staff to create detailed exercise plans for their patients, specifically within the ICU ward. Staff can input motivational images and goals for a specified patient, as well as select exercises and the times that they should be performed. This app should increase time efficiency as previously this was all done by hand. Firebase's real-time database provides the user with meaningful data for their plans and is also used for storing the rehab plans once they're complete.

CoJo – The Coding Dojo

Tyler Bryant

BSc (Hons) Computing

CoJo – The Coding Dojo is to aid in the learning and production of code using a variety of programming languages. The web application will give users the knowledge on what each language is used for as well as help to reinforce what has been learnt by providing practice opportunities to build confidence through an instant feedback mechanism to enable meaningful learning. Furthermore, the application tracks user progress throughout via their own account. This tracking system can show the user what topics they are currently working on as well as what other topics could be of interest to them to help broaden their knowledge and encourage developmental growth.



TECHNOLOGIES

- Node.js
- Express
- MongoDB
- XML Data and XLST Stylesheet
- JavaScript

University Module Document Management System

Daniel Joseph Buckley

BSc (Hons) Computing

The current method to manage programmes of study is based on WORD templates that are viewed using SharePoint. This complicates changing the format, because administrators have to manually update each document. In this project, documents are created using XML templates and stored as XML data in a database. XLST stylesheets are used for styling the templates when the user views them. Consequently, all the administrator has to change to modify the format is the XLST stylesheet, without updating the documents or XML data files.



TECHNOLOGIES

- Python
- TensorFlow
- Node.js
- JavaScript
- MongoDB

Merge.AI – Arbitrary Image Stylization

Yutao Chen

BSc (Hons) Computing

Arbitrary Image Stylization is a technique based on neural optimization algorithm – used to take two images – a content image and a style image – and merge them together, so the output image looks like the content image, but is “painted” in the style from the style image. This is implemented by optimizing the output image to match the content features of the content image and the style features of the style image. These features are extracted from both images using a convolutional neural network. Users are welcome to choose their own content and style images of any kind and any size, and to customize the algorithm parameters (such as content/style weights, number of iterations etc.).



TECHNOLOGIES

- Node.js
- MongoDB
- Express, Pug
- Mongoose
- Javascript
- JQuery

Lockdown – Cyber Security Test for Businesses

Jordan Collings

BSc (Hons) Computing

The ‘Lockdown’ cyber security test application for businesses is software that has been designed to allow any business to do a comprehensive test of their cyber security which will mean that it will be easier to see where there are gaps within cyber security in the business due to the feedback given by the software. Currently, many businesses do not know what cyber security measures they need to take or have a system in place where they can test themselves on typical measures within the cyber security industry. To create this software the usage of Node.js allows for a secure application with increased functionality using node packages as well as using MongoDB with Mongoose to interact with a fast and modern database in a NoSQL environment.

EasyOnline

TECHNOLOGIES

- Android Studio with Java
- WebSockets
- Firebase



TECHNOLOGIES

- MongoDB
- Express
- Angular
- Node
- Material UI



TECHNOLOGIES

- C#
- Unity3D
- Visual Studio 2019

EasyOnline

Sam Crowe

BSc (Hons) Computing

With technology constantly evolving, it is becoming increasingly harder for the older generation (ages 70+) to use social media. My application aims to make a social media application similar to Facebook, without all the unnecessary features and with extra features designed specifically for the older generation. Extra Features to be included: Many "Help" buttons to explain specifically what to do, adjustable font size to suit individual needs, simple colour scheme for easy usage and more.

New Starters Management System

Paulo De Jesus

BSc (Hons) Computing

The process for on boarding new starters at an organisation I work for has grown over time, but most of the processes are done manually which involves sending emails around, leaving room for possible errors. This project is a web-based system which is designed to help the on-boarding process of a new starter. The objective is to automate the process as much as possible by doing things such as creating users automatically, assigning licenses and generating the appropriate documentation while keeping all the data stored centrally, reducing the need for manual intervention to as little as possible.

Maple Leaf Story

Yifu Du

BSc (Hons) Computing

This is an ARPG type game that runs on a PC. Players can interact through the keyboard. Things players can do in the game include: fighting enemies, changing equipment, switching maps, and interacting with map agencies. Players can use three weapons in the game, with different combat actions. There are two types of enemies: swordsman and boss. They have different modes of action. The game has two different maps, and players can switch between special locations on the map. The background of the game is the Middle Ages of the Maple Leaf World. The player plays an adventurer.



Upvent – Event Advertising System

TECHNOLOGIES

- React.js
- Express.js
- RxJS
- Node.js
- MongoDB
- Heroku

Jamie Everett

BSc (Hons) Computing

Upvent is a full stack web application which provides a platform for both individuals and corporations to upload advertisements for their events. The aim of this application is to improve visibility of social events and help connect people with similar interests. Events can be searched, filtered and sorted based on a range of criteria (e.g. location, cost and date). Logged in users are provided with a curated event list of recommendations based on their attributes and interests. Users can subscribe to events and receive updates by email which are sent by the event owner through an announcement feature.



Digital Library

Jacob Fairhead

BSc (Hons) Computing

Many people have home libraries of books and films, ranging in sizes. Some of these collections can become hard to keep track of, which is why I have developed an ease of life application that allows owners of collections that exist of, but not limited to, films and books. While intended for home use, this application can see benefit in any library, such as public and school libraries. My application has been designed to easily store, view and manage items within the collection, allowing for fast identification of what is currently owned, becoming particularly useful in the home scenario where you are looking for a gift, ensuring you don't purchase a duplicate.

TECHNOLOGIES

- Visual Basic
- Visual Studio 2019
- Microsoft Access 2019



Ryder

Callum Flynn

BSc (Hons) Computing

Written in PHP, Ryder is a web application designed to make sharing journeys easier and more accessible. Ryder will be your chosen application when looking to share your one-off or daily commutes. Ryder will give you the platform to form new friendships and save £1000's in travel costs. Ryder's search algorithm will search for any journeys within a 10-mile radius to your original search, helping you match with other commuters. Worried about sharing rides? Check out the other user's profiles to view more information about them and to check out their profile picture.

TECHNOLOGIES

- HTML
- JavaScript
- JQuery
- PHP
- MYSQL
- Ajax



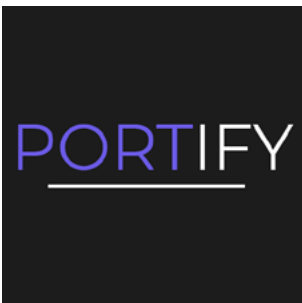
TECHNOLOGIES

- AR Core
- Android (Java)
- Firebase
- Sceneform
- Blender
- Google Maps API



TECHNOLOGIES

- HTML
- CSS
- JavaScript
- MongoDB
- Node.js



TECHNOLOGIES

- Angular
- MongoDB
- Express
- Node.js
- Amazon S3
- Socket.io

AARA

Adam Foot

BSc (Hons) Computing

AARA uses augmented reality to enable a more interactive approach to learning about the history of heritage sites. It allows the user to use their android mobile phones to scan augmented images which when triggered are shown animated 3D models and facts about the specific area of interest. Google Maps is used to allow the user to find nearby sites to them that are supported by the application, with added directions. AARA is designed to try and encourage more people to visit heritage sites, and to try and get younger people involved by learning about their history in a fun and interactive way.

Supply Line

Matthew Garner

BSc (Hons) Computing

This Website allows users to create Army lists for the board game Warhammer AOS in a clean easy to read manner for the use in tournaments and events without placing stress on tourney or event handlers by providing a clean cut uniform design to all lists made on the site. The website also does not allow for an invalid list to be made further reducing the time organisers need to spend looking through potentially hundreds of entries this is achieved through a Node.js server and MongoDB database.

Portify

Chris Gilchrist

BSc (Hons) Computing

Portify is a responsive web application designed to offer students a platform where they can showcase the projects they have created during their time at university. It allows users to interact with one another in a feed-like layout where they can like, comment and share the creations of others. It is also intended to allow the user to build up a portfolio of their work which could then be used when communicating with future employers. Thus, providing the ability to show off their skills they have acquired whilst at university.



MONCORD

TECHNOLOGIES

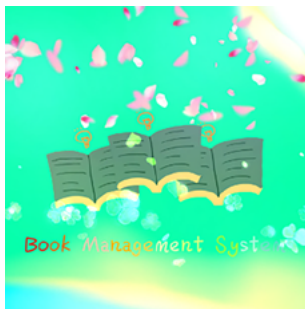
- Docker
- React
- Node
- MongoDB
- Express
- Socket.io

Moncord – A Chat App for Developers

Charles J Green

BSc (Hons) Computing

Moncord is an application that has been designed with developers in mind. The application allows developers to communicate more effectively between themselves when they are working remotely or are separated geographically. Careful consideration has been given to ensure that the application is secure, both for the user's data as well as the data being shared between said users. The application is able to be deployed nearly anywhere thanks to the use of Docker. The use of React, Node and Mongo and an Agile methodology will allow the application to be maintained and updated further in the future.



TECHNOLOGIES

- C# (Visual Studio 2017)
- .NET Framework
- SQL Server 2012

Book Management System

Linfeng Guan

BSc (Hons) Computing

The system can realise the function of user management, basic data management, library management, the reader management, database management and so on. I designed the system and divided it into three roles - an administrator that is responsible for the whole of the system data management, a chief librarian and borrow books information management readers landing system can view their loan information, and an online search query for book information. Book management includes a wide range of books and users to borrow information, including a lot of information and data management.



TECHNOLOGIES

- C#
- Visual Studio

Malware Inc.

Jay Guillard

BSc (Hons) Computing

Malware Inc. is a game based on the popular mobile game Plague Inc. In my game, the user is able to develop their own malware and upgrade it to make it more profitable and infectious. As the malware develops, the probability of infecting other countries goes up. The game is complete once either the malware has spread to every device in the world or a solution to resolve the malware has been discovered. All the statistics of a country will be displayed using data grids to allow the user to see how well their malware is spreading. All of this is created using Visual Studio and Windows Forms for the user interface, as they have ready-made assets to create all aspects of the interface.



TECHNOLOGIES

- C#
- ASP.NET Core
- HTML, CSS
- JavaScript
- MySQL Server
- Google Cloud Platform

Triviapp – A Web-Based Trivia Game

Jordan Hall

BSc (Hons) Computing

This is an application where users can play trivia games and registered users can create new quizzes, and unlike other line games there are now adverts to generate income to support the hosting of the website. This application does not require users to rely upon it and to host itself. This project is a web-based Trivia game application using the C# ASP.NET Core, storing Quizzes and Users within a MySQL Database, published and distributed via the Google Cloud Platform. Guest users can browse and play Quizzes, and registered users can also create new Quizzes, with questions and answers. Triviapp is designed and aimed at all ages, but mainly for young adults and teenagers, just due to the complexity of the questions, however virtually anyone can participate.



TECHNOLOGIES

- .NET Framework
- SQLServer
- HTML
- CSS

SchoolMate

Callum Harding

BSc (Hons) Computing

SchoolMate is a homework management system that allows teachers to set homework for their students. The application provides the tools to track student's grades and gives teachers analytical data of how their classes are coping with the subject. The primary aim of SchoolMate is to reduce the possibility of students becoming overwhelmed by homework, the way SchoolMate tackles this is by setting a limit to the amount of homework students can be given at a time.



TECHNOLOGIES

- Azure Text Analytics
- MySQL
- PHP
- Chart.js
- JQuery
- HTML/CSS

Head Smart

Kayleigh Haydock

BSc (Hons) Computing

Head Smart is a free self-help interactive tool that aims to improve mental health and enhance academic preparation. The project is aimed at students in further education upwards, who may not wish to seek in-person help with their mental health and academic issues. The app gives users the platform and opportunity to work on the chosen areas in complete anonymity. Offering analytics on the data collected via the 'Tracking' section which can help identify patterns and contributors to their feelings. Students will also have access to a forum connecting them with other like-minded students.



TECHNOLOGIES

- Node.js
- Angular Express
- MongoDB
- NG-ZORRO

Student Online Exam Website

Qing He

BSc (Hons) Computing

Student online exam website is an easy-to-use online testing solution for university and school assessments. Teachers could create an assessment on the network easily and promptly. It is also convenient to publish exam questions, organise an exam and be automatically marked by the website. The aim of website is to release the pressure on the teachers. The teacher only needs to upload the exam questions to the website, and the website will automatically mark the exam questions. This reduces the time for teacher to print and mark the exam questions.



TECHNOLOGIES

- Python
- Deep Learning – TensorFlow
- Keras
- Node.js
- Google Cloud Platform
- Docker

Password Guessing using Generative Adversarial Networks

Rachel Autumn Horner

BSc (Hons) Computing

This project is research focused around the development of a Generative Adversarial Network (GAN) model and data pipeline, with the mainstay being to generate real-world plaintext password datasets that are competitive with state-of-the-art password generation tools. These datasets can be used in cyber-security research alongside brute forcing tools, autonomously. Exploring the comparative Markovian structure in the passGAN paper and validating their hypothesis against my own findings I will deduce whether their approach was feasible. I developed data cleaning tools and visualisation tools alongside this research as needs demanded it, this piece of software is called Litics Analytics.



TECHNOLOGIES

- Oculus Rift
- Unreal Engine
- Blender

VR Flyer

Leon Huxley

BSc (Hons) Computing

Unreal Engine Virtual Reality Wingsuit Experience. Have you ever wanted to experience the feeling of flying down a mountain? Well now you can thanks to Virtual Reality and the Unreal engine. The experience is a mixture of C++, unreal blueprints and free assets. Starting at the top of the mountain choose your path down and guide yourself using the rift controllers, safely to the ground. Get too close or lose your speed and its game over.



Childnet – Web Based App for Safeguarding Advice

Romiell Inso

BSc (Hons) Computing

The Childnet Advice web application aims to protect children from some of the dangers that the Internet can create. By educating the parents on the fundamentals of internet safety, their child can have a safer experience online no matter what the activity, be it social media, gaming, or media streaming. The system can determine how safe their children are from the answers the parents give in an initial quiz. It will give them an insight into what sort of issues they might have to watch out for, as well as give guidelines on the other things they might not realise are important.

TECHNOLOGIES

- Node.js
- Express
- MongoDB
- JavaScript
- Heroku
- GitHub



Second-Hand Car Trading System

Cheng Ji

BSc (Hons) Computing

The purpose of second-hand car trading system is to provide users with a safe and reliable information platform about second-hand car trading. Users who want to become members of the system need to provide personal information, which will only be used for system management and communication between users. Users can browse all the second-hand cars being sold through the system, and view their information. Users who want to sell cars can publish the cars they want to sell. The user can leave a message on the details page of the vehicle currently for sale. The car owner can also answer questions through the system. All uploaded vehicles will be classified according to detailed information (like: model, colour).

TECHNOLOGIES

- C#
- My SQL



Unite Restaurant Order Meal Website

Xiaoran Kang

BSc (Hons) Computing

This web application is designed to make ordering meals more convenient for customers – they can choose delivery, collection or order meals in advance. The aim of this website is to reduce the waiting time during meals. Also, customers can comment on the taste of meals and the service of the restaurant. In addition, the website has customer service which can answer questions from customers promptly. Finally, this website has a data analysis section for the restaurants, in order to find the favorite dishes for different age groups, so the manager can launch popular set menus for customers.

TECHNOLOGIES

- Node.js
- Express.js
- MongoDB
- Bootstrap
- Mocha and Chai



Guide Your Mind

Simran Kooner

BSc (Hons) Computing

Guide Your Mind is a mental health support application for students 18+ in Plymouth. The application provides students with support at all times, awareness of the support that's available, personal tutors to be aware of their students mental health and students to review their development. The application provides the below functions: Mental Health/Service Information, Food Requirements, Diary Entry, Mental Health Survey, Relaxation Techniques, Routine Support, Daily Mantras/Quotes, Messaging Services between students and personal tutors and a Help Trigger.

TECHNOLOGIES

- HTML/CSS
- JavaScript
- Ajax
- JQuery
- MongoDB
- GitHub



ManageMe

ManageMe – Platform for Small Business Management

Lewis Kosztan

BSc (Hons) Computing

ManageMe is a full-stack Web app platform that's aimed towards improving management efficiency within small businesses. The platform is best suited for businesses where employees must travel to sites to do their jobs, such as scaffolders, tree surgeons, etc. Leveraging on modern technologies, the project allows users to create a list of job tasks and combine them into workdays to effectively plan a user's week. Employees can access their schedule via a mobile app. This project was created for and will be trialled by a real client/business, who hope to formally use the product after completion.

TECHNOLOGIES

- Angular
- Ionic
- Node.js
- MongoDB
- RxJs
- Heroku



SECEDU – Employee Security Awareness Application

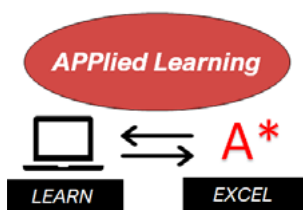
William Le Marquand

BSc (Hons) Computing

With cyber security awareness on the rise, this application will allow organisations to ensure their new employees are aware of current cyber threats. The app is web-based thus allowing it to be used universally on different machines. Furthermore, the application can be used by new employees at an organisation so that they have an understanding of general security awareness. This could be from an External Drive policy, such as not plugging USB drives into work PCs. The application is being built using the web basics (HTML, JavaScript, MongoDB, and Node.js). This technology stack allows the application to be easily distributed to organisations and to be completed professionally.

TECHNOLOGIES

- HTML
- JavaScript
- MongoDB
- Node.js



TECHNOLOGIES

- Node.js
- MongoDB
- Express
- Chart.JS
- Socket.IO

APPLIED Learning

Saichung Lee

BSc (Hons) Computing

APPLIED Learning is an educational web-based application (app). The main purpose of this app is to provide a secure access point for parents and caregivers to help secondary school aged students with their independent learning. This app also allows users to access teaching materials, take tests, view graphical historical results and provides opportunities to discuss subjects within the school environment.



TECHNOLOGIES

- Python
- Pycharm IDE
- Browser Interfacing

Desktop Assistant

Aden Lerwill

BSc (Hons) Computing

This project was envisioned as both a start on a Desktop Assistant that may one day be a competitor to Microsoft Cortana and a way for me to challenge myself in python. While most people may compare Cortana to the likes of Alexa, Siri and Google Assistant they would be right in some aspects, however Cortana works best on the desktop hence why I chose to work on a product similar. My goal is to create a program that will interface with Windows and through voice commands allow the facilitation of various actions, a few of the proposed actions will be opening programs, opening webpages and basic date and time.



TECHNOLOGIES

- Java
- HTML
- CSS
- JavaScript
- MySQL Databases

Campus Office Management System

Ma Bowei

BSc (Hons) Computing

This is a campus office management system. This system is for teachers and school administrators and allows users to easily manage and arrange timetables, which can systemize and automate office management. In this system, teachers and school administrators have different user types and functions, school managers can manage attendance and send notifications, teachers can view meetings and lessons, share files and communicate.



TECHNOLOGIES

- Spring Framework
- Spring Boot
- Redis
- Elastic Search
- Mysql
- Kafka

Q&A Comprehensive Community

Ma Zhuang

BSc (Hons) Computing

To provide a social question and answer website for schools, improve the learning efficiency of teachers and students, and improve the efficiency of communication. This type of website is a question and answer SNS website between an encyclopaedia and traditional Q&A. It is a public knowledge platform, and its value lies in rebuilding the relationship between people and information. Users ask questions and other users answer. The Q&A service expands broad keywords into clear questions and realises the conversion of information to knowledge through constant revision by users.



TECHNOLOGIES

- Unity
- C#
- Blender

Unity – Survival Horror Game

Matthew Macdonald

BSc (Hons) Computing

This project is a survival horror game created in the Unity Engine inspired by other games in the same genre. The aim of the game is to search a maze for a several keys to unlock doors and find their way to the exit of the maze while being chased by a monster that searches the maze for the player. If you are able to leave the maze you win the game but if the monster catches you then you lose and have to start again. The user controls a simple first-person character and will have to navigate the map with minimal assistance from basic equipment. This project developed in Unity with use of free assets from the Unity Asset store. There will also be some aspects made myself using the features in Unity and Blender as well as some of the functionality being created using C#.



Lead The Way

TECHNOLOGIES

- HTML
- CSS
- ASP.NET/C#
- SQL Server

Lead The Way – A Dog Walking Website

Jade Marshall

BSc (Hons) Computing

Lead The Way is a website for both new and experienced dog owners to find dog walking locations all over the country. The website allows you to view different walks based on your specification, which can include the type of terrain you would like to walk on to the facilities available. Another feature including reported cases of dog illnesses which can be spread by socialising to help protect them. The use of HTML, CSS and ASP.NET for the front and back end, with an underlying use of SQL Server for the database.



TECHNOLOGIES

- Xamarin
- Android
- IOS
- C#
- XAML
- Firebase

Student Car Share

Jade McCrory-Apperley

BSc (Hons) Computing

This application provides University of Plymouth students with a car sharing service. Currently students are driving themselves back home for the holidays independently, whilst other students are paying for public transport when they could be sharing together. Students need access to affordable transport and car sharing would be an economical way to solve this issue, helping reduce greenhouse gas emissions and carbon monoxide pollution. The cross-platform Xamarin mobile application can be run on both Android and iOS devices, using Googles Firebase real-time database to provide the most up-to-date data.



TECHNOLOGIES

- Java
- Eclipse
- Spring MVC
- MySQL
- Tomcat

Parking Management System

Heng Ni

BSc (Hons) Computing

This project aims to design a simple, efficient and humanized parking lot management system. The main functionality of such a system includes automatic vehicle registration (this is done by uploading pictures of the license plates of vehicles currently parked), vehicle access logs, management of parking fees & tariffs, and the display of available capacity at any given time. In order to improve safety and reliability only people with an administrator account can log in.



TECHNOLOGIES

- SQL sever
- sp.net
- B/S Architecture

Student Apartment Management System

Qiansong Nie

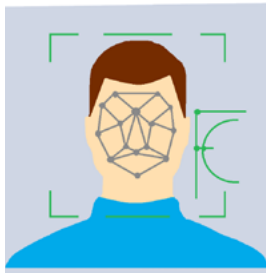
BSc (Hons) Computing

This is a project about student dormitory management system. The system is divided into two parts: student login and administrator login. Student dormitory management software is mainly for apartment, dormitory configuration, health inspection, student violations, student accommodation enquiries, modifications, updates, etc. Through the functions provided users can complete the corresponding operations to meet the needs of the student dormitory management system and get a faster understanding of each student's accommodation. Through the design of this system, I can more objectively understand the current needs of student dormitory management and through improvement and innovation develop a system suitable for the majority of users, so as to improve their professional knowledge and design level.



TECHNOLOGIES

- MongoDB
- Express
- Vue.js
- Node.js
- Visual Studio Code
- Javascript



TECHNOLOGIES

- Python
- OpenCV
- Neo4j
- Py2neo
- NumPy
- GitHub



TECHNOLOGIES

- ASP.NET MVC (.NET Framework)
- Microsoft SQL
- Azure Blobs
- Bootstrap
- JavaScript Frameworks
- FFmpeg

Local Doings

David O'Callaghan

BSc (Hons) Computing

Local Doings is a web-based social media application for small communities who want more locally related information. Users are registered to a community according to their postcode, so all information is relevant to their local neighbourhood. A message board feature allows registered users to add information, notices, and start discussions on topics they feel are of interest to other community users. Registered users can also chat in real time with other online users. The facility for users to exchange, loan, sell or donate unwanted items with neighbours by placing them in the 'swap shop', is another feature of the app. The app can be moderated and allows a nominated user to have administrative rights.

Face Checker

Dominic Ralphs

BSc (Hons) Computing

Face Checker is a piece of software used for entrance security. This software is designed to eliminate the need for employees to use ID badges for entry into a workplace. It uses facial recognition to check the person standing in front of the camera against the database of employees, once verified as an employee the gate/door will open and a message will pop up will welcome them via their name and floor they work on. The software was created using mostly python, OpenCV and neo4j as the database server. This software could ultimately be used wherever secure access is required, e.g. Government facilities or other high level facilities.

Vollab (Collaborative Video Repository Web Application)

Daniel Richards

BSc (Hons) Computing

Vollab is a repository web application optimised for video editing projects. Users can create project workspaces in which they can define details such as the project's genre (Action, Animation, Horror, etc.). The web application supports three main multimedia formats; Video, Audio and Image. The user can upload these files to their project workstation, where they will be able to review all the files currently on their project, and also download them on to their machine to use in their project work. Users can also add other users to their projects, providing new expertise, as well as a means to generate feedback on project files.



TECHNOLOGIES

- Node.js
- Express
- AngularJS
- Mongoose
- Mocha/Chai



TECHNOLOGIES

- JavaScript
- MySQL
- HTML
- CSS



TECHNOLOGIES

- Android Studio
- Database

That's the Spirit

Jordan Searle

BSc (Hons) Computing

That's the Spirit is a database web application built to speed up and plan social events. It allows the host to find games ranging from 'Ring of Fire' to 'Charades' quickly and at any time. With content filters built into the website, activities for attendees of any age group can be searched or filtered. Whilst the user has an internet connection games can be viewed, bookmarked and added to any event list and on admin approval the addition of games or changes can be made by users.

Campus Used Goods Trading Website

Zijia Song

BSc (Hons) Computing

This is a second-hand trading website for students. The aim is to reduce the waste of students buying unnecessary new products for further studies, graduation or admission. At the same time, you can also sell products that you no longer need, you can achieve the maximum value of the product to avoid waste, and buyers can buy the products they need at a lower price. The website has an administrator system and a user system. The administrator system can manage and check products, manage users, make announcements, manage payments, manage reviews, and manage user feedback. The user system can register and log in, edit and upload personal information, edit and upload product information, browse and purchase products, write reviews, give feedback to administrators, and send and receive messages within the website from each other.

Snapshot

Adam Stone

BSc (Hons) Computing

The problem – currently video game photography has no real place on the internet to call their own and currently use twitter or Instagram to share their pictures which has its issues and they would like a more personalised experience for them. The Solution – To make an app that allows them to share their photos.



Character Creator and Randomiser

Eddie Turnbull

BSc (Hons) Computing

As an avid Dungeons and Dragons player and campaign runner, I often struggle with giving my players lots of interesting and unique characters. I want to create my own app with character traits and backstories that will interest my players and help me take my campaign running skills to the next level.

TECHNOLOGIES

- Netbeans
- Java



Code.Scribe

Code.Scribe – Code Learning App to Aid Teaching KS3/KS4

Adam Viant

BSc (Hons) Computing

This project is a web application designed to help children of secondary school age (Key Stages 3/4) to learn to programme and code, giving them the basics to start off and helping them with common problems when starting. The application will provide exercises to help encourage self-thought, a skill that is vital in the computing industry, as well as a live code editor to give immediate feedback to the user. The application will cover web development languages such as HTML, JS, CSS and programming languages such as C#. The application itself will be hosted on a web server using Node.js and will incorporate a host of web technologies to provide a smooth and finished experience when using the application.

TECHNOLOGIES

- Node.js
- Express
- AngularJS
- MongoDB
- Mongoose



Untitled Shooter Game

Joseph Wainwright

BSc (Hons) Computing

Untitled Shooter Game is a traditional first person, single player, shooter game that utilises free assets and C++ blueprints for Unreal Engine 4. The game pits the player against numerous AI in small, close quarter maps with the objective of being able to eliminate all enemies without dying. To accomplish this the player will have a variety of weapons available to them to use.

TECHNOLOGIES

- Unreal Engine 4
- C++



TECHNOLOGIES

- HTML
- CSS
- JavaScript

Web-Based Service Desk Training System

Thomas Walsh

BSc (Hons) Computing

This project aims to produce a web-based training utility for the induction process of new employees that join the Service Desk of the specific company I am working with. The site will provide new employees with the knowledge of basic tasks that their jobs entail, while also providing them with knowledge about the team they work within and others they will interact with and how this process works. The data that is provided by the client will be applied to the website and will be arranged into certain categories and subcategories throughout the site and the employees will be able to go through the site navigating to the specific information they need and will be able to demo the toolset in which they will have access to while working on the Service Desk.



TECHNOLOGIES

- PHP
- My SQL
- Visual Studio 2019

Pet Hospital Management System

Haonan Wang

BSc (Hons) Computing

This is a pet hospital management system that runs on the web. Users can interact through keyboard and mouse control. Through this website, the user can view and purchase pet medicines, pet products, pet toys and book the pet to see a vet. The administrator can, through the website, see the pet drug information, user information, pet supplies order management and vet information, the administrator can also add, change or delete the announcement of the home page. This is an online management system, the account application is very simple and convenient, each customer of the hospital can make an application, of course, in order to better distinguish between the customer and the administrator, the hospital administrator should choose the administrator application interface when applying for the account, otherwise will not be able to successfully log in the administrator interface.



TECHNOLOGIES

- Android Studio
- Java
- Firebase

Caring On the Go

Henry Westlake

BSc (Hons) Computing

This is a bespoke app for a client who is a self-employed carer in the community. At present they rely solely on hard copies of all the information or their clients, which they must physically pass to other carers when they go on holiday. This app will store all the client data in one space for them, it will encompass an invite system that they can use to invite the other carers to view the information on the clients without having to hand over hard copies that may get lost. The client will then be able to control who is viewing this information and remove them if necessary. Also, to keep up with the newest GDPR guidelines there will be a secure login via google and firebase authentication, on top of this the database that will be done via firebase will also have its data encrypted to keep it as secure as possible.



TECHNOLOGIES

- React Native
- Mobile (iOS and Android)

Skate Buddy

Jack Williams

BSc (Hons) Computing

Skate Buddy is designed to help teach people to skateboard and get involved in the skateboarding community. By providing a dataset of tricks, users can learn while on the move or at the park and record their skills. Sometimes it can be hard learning to skate on your own and it can be intimidating to approaching a group of people at the skate park. Users can make use of the skate map service to find experienced skaters wanting to teach someone to skate with or a good skate spot to practice. Even if you're already experienced and want to teach others, you can put yourself on the map for others to see.



TECHNOLOGIES

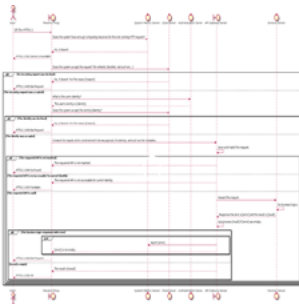
- MYSQL Server
- HTML
- ASP.net
- VS 2015

Teacher Information Management System

Jia Wu

BSc (Hons) Computing

Teacher information management system is a program developed for administrators and teachers. This program can manage the teacher's information. The administrator can create a new teacher account. Administrators can view or modify teacher information. Teachers can use the program to update their personal information, upload published papers and documents. Teachers can also use the chat function to share work experience with other teachers and view work schedules and timetables.



TECHNOLOGIES

- Python
- MySQL Database
- Asp.net

Tourism Website Design

Hanrui Zhang

BSc (Hons) Computing

This app is a travel website design, specifically designed for each user who wants to travel an optimal route, this project can even help users buy tickets. Now more and more young people like to travel, sometimes they know where they want to go but do not know how to plan a route. This program will help users design the best train routes so that they don't have to worry about detours.



Student Document System

TECHNOLOGIES

- Node.js
- MySQL
- NPM
- GIT
- CSS

Student Document Online Management System

Yuan Zhao

BSc (Hons) Computing

It is very convenient for students to quickly download and upload their own files anytime and anywhere. This project supports upload in most document formats and resumes from breakpoints. After uploading to the system, students can also search and output files in different formats according to their needs, which is widely used. Students can also share their own documents with other students to facilitate communication. The system may support other functions in the future, such as online preview of files and online modifications and keep a historical backup of the files.

BSc (Hons) Computer and Information Security



TECHNOLOGIES

- MYSQL
- Netbeans IDE
- Java

Baitmaster Phishing Manager

Joshua Allinson

BSc (Hons) Computer and Information Security

Phishing attacks are one of the most prevalent attacks used against businesses, with 80% of businesses reporting having been the target of such attacks over a 12-month period. The BaitMaster Phishing Manager will allow managers to send test phishing emails to employees of their company. From there managers can view and analyse results from these campaigns, such as which departments, offices or members of staff are more likely to take the bait. This will allow managers to better identify training and support requirements, and to allocate security funding throughout the business accordingly.



TECHNOLOGIES

- C#
- Unity
- Visual Studio
- Git

Malware Defence Simulation

Alex Ball

BSc (Hons) Computer and Information Security

This project simulates various cyber-attacks against countries around the world. The player must then buy security defences to protect these countries. These defences include intrusion detection systems, funding research into new vulnerabilities etc. The player also gains points for each attack defended against. The aim is to last as long as possible without running out of points. The game has uses within education to teach employees or students the value of computer security as well as how this is achieved. This method of teaching can be fun and interesting as well as informative.



TECHNOLOGIES

- Microsoft SQL Server Management Studio
- Visual Studio 2017
- C#
- SQL
- Snort

Linked – Account-to-User Management and Alert Tool

Nicholas Boulter

BSc (Hons) Computer and Information Security

Linked is a windows application aimed for Network and Security Operations Centre analysts, to aid in identifying patterns and abnormal behaviour towards the users in an environment, rather than the accounts they use. By associating multiple accounts towards a single person, the application will automatically group together events from multiple systems. This reduces the time that analysts have to comb through multiple searches and lookups on a person rather than the accounts they use. Exporting these results into XML allows to use this application in tandem with existing SIEM tools, and Snort integration allows for alerts to be generated in the case of abnormal behaviour for users.



TECHNOLOGIES

- HTML
- CSS
- SQL
- C#
- Visual Studio

Secure Platform for Counselling Management

Christopher Carpenter

BSc (Hons) Computer and Information Security

This project is designed to provide mental health counsellors with a secure platform to manage their clients. Client communications and personal data is very sensitive, and the use of technologies such as SMS messaging and e-mail increases the risk of communications data being exposed, either by interception or human error. This platform provides a secure means of communication for clients to interact with counsellors and for counsellors to manage the data of their clients.



TECHNOLOGIES

- Python
- Machine Learning
- Angular
- Node.js
- Mongo DB
- WebTRC

FaceLock

Alexander Carthew

BSc (Hons) Computer and Information Security

FaceLock is a fully functioning facial recognition application running on a remote door lock with the aim to provide secure access to homes and businesses. The door lock is accompanied with a MEAN stack incorporating an angular front-end webpage allowing users to sign up and register faces to unlock the door and start a two way live stream between the lock and webpage, so they can check on who is outside and remotely unlock the door. A user will be able to register and create a secure unique account to personalise their experience while using FaceLock. The web application will store fully encrypted passwords and use JWT web tokens to ensure the user's session is secure.



TECHNOLOGIES

- Raspbian GNU+Linux
- Apache
- PHP
- NetworkML

Blockhouse

James Eric Davidson

BSc (Hons) Computer and Information Security

All-in-one, plug-and-play network filtering software, deployed on a Raspberry Pi. Designed for the typical 'tech' consumer, who owns a variety of networked devices, including smart home devices: Amazon Alexa, Google Home, Phillips HUE, NEST, etc. Each device in the users home need not be configured individually (e.g.adjusting operating system settings). Ports, protocols and services will be blocked before traffic enters and exits the network. As the software will run on a Raspberry Pi this will regulate all traffic into and out of the network.



TECHNOLOGIES

- Elastic Stack
- Python
- NumPy
- Pandas
- Scikit-Learn
- Ubuntu

Anomaly Detection Email Analysis Tool

Levi Hedges

BSc (Hons) Computer and Information Security

A big challenge within insider threat is preventing harmful activities such as data exfiltration (intentional or otherwise) over email. This tool is designed to use anomaly detection techniques to find email activity that can be flagged and then investigated by a human analyst. A multivariate anomaly detection approach is used to detect unusual features within emails. This could include the date and times emails are being sent, the nature of the attachments or the size in bytes of the email. Once potential anomalies have been discovered an alert will be generated for further investigation.



TECHNOLOGIES

- Flask
- Python 3
- Bootstrap

Session Hijacker

Harry Hewett

BSc (Hons) Computer and Information Security

Session Hijacker is an offensive security tool that steals and processes the target's browser cookies to determine the validity of their sessions for websites that have login functionality. The tool is useful to test websites for request forgery, and also for when time is critical to intercept a user in a lawful intelligence-based scenario. It consists of an agent executing on the target computer which sends the cookies to a server where processing occurs. The result is a dashboard displaying the target's valid sessions to the individual conducting the test with options to launch into each one.



TECHNOLOGIES

- Linux (Debian)
- Apache HTTP server
- MariaDB
- PHP with Symfony Framework
- Bash
- Nmap

Polaris

Thomas Hynes

BSc (Hons) Computer and Information Security

Polaris is an automated cybersecurity guidance tool tailored to home users. Through gentle guiding it walks its users through the many stages of a vulnerability assessment, helping users identify their assets through its host discovery and management system before initiating its scans and parsing through the results. Polaris then analyses data from trusted sources to detect vulnerable or suspicious services, translating its findings into meaningful, audience-aware reports that detail any issues alongside formative guidance and advice to enable users to address and prevent these problems.



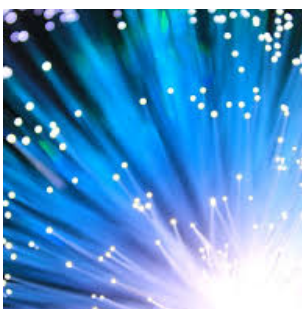
TECHNOLOGIES

- Python
- Tkinter
- Bash
- GitHub
- Kali Linux



TECHNOLOGIES

- Unity
- Visual Studio
- GitHub
- Photoshop
- BFXR



TECHNOLOGIES

- VMware
- Ubuntu 18
- Zeek (Bro)
- Flask Framework
- Weka
- MySQL

EzPz Toolz

Henry Kaminarides

BSc (Hons) Computer and Information Security

EzPz Toolz is a graphical penetration testing tool for Kali Linux. This tool is set out to make popular command line pen testing tools such as Nmap and Metasploit user friendly. This enables professionals and businesses to carry out efficient penetration tests in order to improve their IT security. This tool is programmed in Python and uses the Tkinter framework for the GUI and can run commands with just a couple of clicks. The GUI takes the user's inputs, processes them through multiple terminal sessions for each application and then outputs the results clearly to the screen.

Hack the World

Zachary Knights

BSc (Hons) Computer and Information Security

Hack the World is an edutainment game in which the player is a hacker trying to gain access to every device in the world. To do this the player must employ several methods of malicious attack. This includes more traditional malware methods as well as social engineering techniques. The main goal behind the game is to educate players on different methods of social engineering and malware attacks, as well as ways of protecting against them via an interesting and fun simulation game. This would allow players who aren't technologically savvy to gain a better understanding of how hackers operate.

Agile Network Analysis Tool

Jurgens Tjiurimo Kuzatjike

BSc (Hons) Computer and Information Security

The aim of this project is to develop a Machine Learning Classifier to infer DoS, DDoS and anomalies on the network traffic. Data will be collected locally in a virtualised environment using Zeek (Bro) installed in Ubuntu in VMware. A second Ubuntu 18 system is also set up as the attacking system to simulate an attack. Captured data is then pre-processed and made ready for machine learning using a Bash script. Using Weka Supervised machine learning algorithms, pre-processed data will then be trained and tested to classify the captured behaviour as malicious or normal. The results are then displayed to the Web application.

HAVD



TECHNOLOGIES

- C#
- Assembly
- Amazon Web Services
- LAMP Stack
- RStudio
- Multiple Back-Propagation

Hardware Assisted Virtualisation Detection

James Murray

BSc (Hons) Computer and Information Security

This is a multi-disciplinary project, utilising aspects of computer science, security, cloud computing and data science. We will investigate correlations between the timing of NOP and CPUID calls with the enhanced context of CPU model, family, stepping and microcode revision. The project builds upon research with the goal of verifying existing results across heterogeneous hardware, discovering the efficacy of hardware virtualisation over time and producing a neural network to automate virtual environment detection and observation evasion.



TECHNOLOGIES

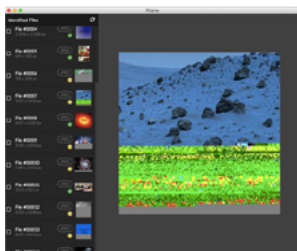
- Java
- Microsoft Windows
- NetBeans

Network Security Scanner

Eleanor Norris

BSc (Hons) Computer and Information Security

A simple GUI network scanner that allows those who are not computer literate to find out more about networks they can connect to in order to assess how secure they are and how this can affect a user in a way that is easy and quick to understand. It will also provide general security information regarding connecting to a network and the risks you might face and simple ways to reduce them. This is a simple Java application designed to increase the attention paid to network security by any user.



TECHNOLOGIES

- Python
- OpenCV
- Rust
- Vue.js
- TypeScript

Advanced Bi-Fragment Gap Carving using Computer Vision

Paik Paustian

BSc (Hons) Computer and Information Security

Data carving is a discipline within the field of digital forensics that focuses on recovering files in the absence of file system metadata. While contiguously stored files are recoverable using existing techniques, fragmented files prove to be a challenge due to the exponential (or worse) algorithmic complexity of existing approaches which often require unrealistic amounts of human interaction for validation. This project aims to explore and develop alternative, more efficient approaches to reconstruct bi-fragmented image files using advanced carving algorithms and computer vision technologies.



TECHNOLOGIES

- Golang
- Python3
- Hashcorp Vault
- FastAPI
- Starlette
- Gorilla Websocket

Cryptnetic – Encrypted Application Wrapper

Oliver Press

BSc (Hons) Computer and Information Security

Today's sophisticated modern malware products use polymorphism to evade detection from current generations of endpoint security solutions by re-encrypting upon duplication. This helps protect malware from detection with each duplication's unique signature. This ensures malware life is extended protecting malware coders' investment! Cryptnetic aims to bring in polymorphism technology providing clients security and complete control over their deployed applications, using strengths, techniques and tactics employed in the malware domain in order to gain an advantage over them. This allows robust application deployment worldwide, without compromising original application function.



TECHNOLOGIES

- ASP.NET
- Web Application
- C#

Diogel

Elis Roberts

BSc (Hons) Computer and Information Security

Diogel is a password manager which tool allows you to store passwords securely with SHA-2 hashing. The tool will also allow you to generate passwords from a list of password criteria to ensure you are using strong and secure passwords. It will strength check passwords you input and check leaked password databases to ensure these passwords are not at risk.



TECHNOLOGIES

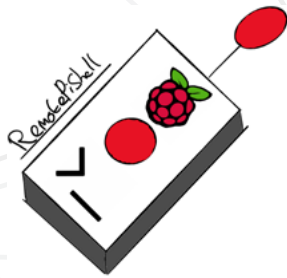
- PHP
- Laravel
- MySQL
- Bootstrap
- Ubuntu Server
- Sublime Text

University Sports League Management System

James Shobbrook

BSc (Hons) Computer and Information Security

This system has been built to make it simple for students of a university to be kept up to date with all things relevant to their competitive sports whilst at university. The technologies implemented allow features and interaction with the teams themselves and the other teams in their league. My project has been built with security as the top priority and has various techniques used to allow a smooth and secure experience using the system.



Remote Pi Shell – Physically Deployable Remote Shell

Tom Stacey

BSc (Hons) Computer and Information Security

TECHNOLOGIES

- Raspberry Pi (hardware implant)
- Node.js (C2 application)
- Python (deployment script)
- Autossh (persistent tunnel)
- Xtermjs (web-based terminal emulation)
- Bootstrap (User Interface Design)

Simulations of real-world attacks from an organized group of hackers, also known as 'red teaming', encompasses a physical attack vector, whereby attackers break into the target's building with intent to gain access to the target's internal network. This project aims to combat the challenges red teamers face when conducting such attacks by greatly simplifying the deployment and use of hardware implants in addition to reducing the time required to gain an initial foothold. A web application will exist that allows users to access multiple remote shells as well as the ability to add or remove new/old implants. A deployment script will enable a timely setup of implants for instant use in the field.



PyScan

TECHNOLOGIES

- Python
- Metasploit
- GitHub
- VMware Workstation
- Ubuntu
- Linux

PyScan – A Vulnerability Scanner Application

Richard James Stanley

BSc (Hons) Computer and Information Security

With the increasing importance and reliance on computer systems and networks globally, as well as the introduction of new technologies, the threat of a breach or attack on these systems is rising. A successful breach or attack of a computer system or network could have significant consequences to an organisation, such as financial and reputational damage. PyScan is a simple desktop application which allows you to easily scan computer systems and networks for vulnerabilities using Python scripts and save the results when completed. It is intended for educational and professional use.



Attack Surface Analyzer 2.0 for Splunk

Lawrence Stowe

BSc (Hons) Computer and Information Security

TECHNOLOGIES

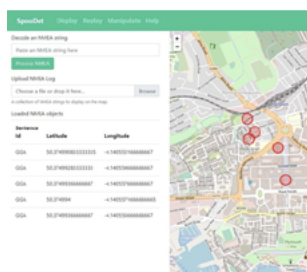
- Microsoft Attack Surface Analyzer 2.0
- Splunk
- Powershell
- JSON
- Windows Server
- Ubuntu Server

When installing software from new or untrusted sources it's extremely difficult to know exactly what's happening on our systems. Installations require elevated privileges which can lead to undesired configuration changes. Attack Surface Analyzer for Splunk looks to build upon Microsoft's open source tool by automating the scanning process and feeding the results into a tailor made Splunk application. The application provides a scalable solution which can be easily integrated into any enterprise, so containing pre-developed searches and dashboards for instant data visualization and monitoring.



TECHNOLOGIES

- Xamarin.Forms
- C#
- Android
- SQLite
- OCR



TECHNOLOGIES

- .NET
- Python
- TypeScript
- Vue.js
- Arduino



TECHNOLOGIES

- Docker
- ELK stack
- JSON
- PowerShell
- Active Directory
- YAML
- AWS

Personal Medical App – PalmPharm

Tin-Long Sung

BSc (Hons) Computer and Information Security

Have you ever forgot to take a daily medicine or not sure whether you already took it or not? Or while you are in pain and yet you cannot find your paracetamol? PalmPharm is now at your rescue! PalmPharm is an android mobile app which allows you to set up an alarm to remind you to take medicine punctually. A notification with all the details such as dosage, frequency and names will pop up and the alarm will go off to prompt you to take medicine. You can also use PalmPharm to make a checklist of all the details of the medicine you have at home including types, quantity and expiry date etc. which will enable you to locate them easily when you need them.

Anomaly Based Detection of GPS Spoofing

Peter Tkac

BSc (Hons) Computer and Information Security

Global dependency on GPS is on the rise thanks to technologies like autonomous vehicles and mobile devices. It was developed many years ago with no security in mind and therefore is susceptible to various types of attacks, including GPS spoofing, where a malicious actor transmits artificially crafted signals that interfere with receiving devices. While it is virtually impossible to prevent GPS spoofing its detection is critical to ensure backup systems can be used. This project aims to detect spoofing in real-time by examining incoming GPS signals and looking for anomalies.

AD Invigilator – Active Directory Monitoring and Alerting

Lewis Tupholme

BSc (Hons) Computer and Information Security

AD Invigilator is an open-source security information and event management (SIEM) solution for monitoring Microsoft's Active Directory. This solution aggregates both Microsoft security events and a set of predefined custom audit events to a centralised location where ingestion and analysis is applied using correlation techniques to aid the visualisation of significant security events occurring in real time. Bespoke alerts are then created when certain security thresholds are met aiding in the detection time of security related incidents. Additionally, AD Invigilator offers insight and visibility into the everyday usage of Active Directory by utilising centralised user-friendly dashboards.



TECHNOLOGIES

- Java
- Neural Networks
- Oracle Database
- Python

Continuous Authentication using Keystroke Analysis

Daniel Walters

BSc (Hons) Computer and Information Security

This project was designed with the ambition of being able to constantly authenticate somebody while they use a system rather than just the one time authentication (log-in) password. It records the time between specific keys (digraphs) but not the keys themselves, so that what the user is typing is still protected. These times are fed into a back-propagation neural network along with all other users' times in order to try and create the strongest network possible. This would provide benefits with systems that are accessible to members of the public but are only for use by staff (e.g. hospitals).



TECHNOLOGIES

- Python
- MATLAB
- OpenCV
- Neural Networks

Universal Steganalysis

Ben White

BSc (Hons) Computer and Information Security

Universal steganography detection, using visually similar images, machine learning and image data analysis. Steganography aims to conceal messages or information within another file. Detecting steganography within images has been a challenge since the conceptualisation of the technique. Steganalysis is an area that focuses mainly on deciding whether a carrier has been steg'd and less on the content of the hidden message. If we can detect the message is there we don't necessarily need to know the content of the message.



TECHNOLOGIES

- Python
- Node.js
- IPFS
- Docker
- Hyperledger Fabric
- Google Cloud Platform

Health Chain

Kieran Daniel Yalland

BSc (Hons) Computer and Information Security

This project is an electronic medical record system for patients and medical professionals to manage their own appointments, check-ups, medical details and allows the user to have control over their permissions. Using permission based Blockchain helps protect data on an encrypted ledger fragmenting data across nodes in the network. Use of smart contracts ensure that data never reaches the wrong hands due to it being distributed across the blockchain therefore every transaction is validated by the other peers. Users have the access to edit their own records ensuring information is up to date and correct.

BSc (Hons) Computer Systems and Networks



TECHNOLOGIES

- Simple Network Management Protocol (SNMP)
- Netflow
- Ping
- Universal Dashboard

Active Network Management Dashboard

Jack Clayden

BSc (Hons) Computer Systems and Networks

I created this software to help prevent downtime for companies by displaying a dashboard on a monitor in the main network office hub to be constantly visible and aid reaction time. Networks are critical for organisations and downtime can mean costs, so having this software on a large dashboard to consistently monitor for errors or issues can lead to quicker reaction of downtime. Software runs in the background which actively feeds data into databases then is converted into useful data and graphs to be displayed on an organised dashboard to be view 24/7.



TECHNOLOGIES

- Google Cloud Platform
- HTML5
- CSS3
- PHP/MySQL

MTG Buy List Application

Ian A Grainger

BSc (Hons) Computer Systems and Networks

The aim is to produce a web interface to provision a client a platform for the purchase of Magic: The Gathering Collectable Game Cards from customers. With the pricing structure based on the European Market pricing structure and on the Magic Card Market API (MKM). The site will allow a customer to populate a form with the cards they wish to sell. The form allows the customer to set the parameters based on edition, language, rarity and condition. Once completed, the form is submitted and a price is generated for the customer. If this is acceptable, then they send the cards to the client, who upon receipt, accepts the cards and makes any reparation in lieu of payment by either store credit or direct payment.



Ezencoding

TECHNOLOGIES

- .Net Core, SFTP
- Bootstrap 4
- VMWare
- MySQL
- HandBrakeCLI

Ezencoding

Caleb Heath

BSc (Hons) Computer Systems and Networks

Ezencoding is a SaaS platform for clients to get video encoding power without paying for the upfront cost of expensive hardware. The front end consists of a .NET Core webserver behind NGINX and the back end contains a database, multiple agents and an SFTP server, all behind a pfSense firewall. Users can use both our recommended settings for each social media platform or use their own custom one which can be created on the website. Users can view and receive updates via email when each job is processed.



TECHNOLOGIES

- C#
- MongoDB
- Active Directory
- Windows Management Instrumentation
- Windows Services

MADaM – MSP Automated Documentation and Monitoring

James Hemming

BSc (Hons) Computer Systems and Networks

MADaM is an application suite designed for use by MSP's (Multiple Service Providers) to assist in keeping the documentation of multiple clients up to date. It is common while working on site to sometimes overlook updating documentation for changes such as changing an IP or adding a new device to an existing network. MADaM can do an initial or update scan on a network and through automatic installation of a windows service can detect changes as they happen. The system comprises a central control application that receives updates from multiple server applications running within different companies. These servers will detect changes within their networks and report these back to the central control.



TECHNOLOGIES

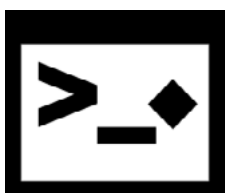
- Node.js
- Debian
- MariaDB
- Tun/Tap
- JQuery
- Linux Container Building System

MegaLAN

Michael Jones

BSc (Hons) Computer Systems and Networks

MegaLAN is a peer to peer VPN client for creating ad hoc Virtual LANs. Users can create private or public LANs. Users can then join these networks within seconds. Virtual LANs appear as a virtual network interface which simulates an extra Ethernet connection between devices. Many older games require that users be on a shared LAN for local multiplayer functionality sometimes using protocols such as IPX. MegaLAN should be suitable for most scenarios where a direct LAN connection is needed between multiple users over the Internet.



SSHMon

TECHNOLOGIES

- ASP.Net Core with Entity Framework Core
- MySQL
- Hangfire, Seq
- Nginx, SSH.Net
- ESXI, Ubuntu
- Bootstrap 4

SSHMon – SAAS Monitoring Solution Using SSH

Alex Knight

BSc (Hons) Computer Systems and Networks

SSHMon – SAAS is a Software Service Monitoring solution designed for Linux servers. Using SSH as the connection medium allows for secure connections without the requirement for end users to install an agent onto their servers. End users can setup various monitoring and notification schedules as well as running commands on servers to develop a deeper understanding of their server performance. The website allows access from any device and means users can keep updated wherever they are.



A Software Suite for E-Sports Teams

Maciej Koszanski

BSc (Hons) Computer Systems and Networks

The goal of this project is to produce a management suite for e-sports organisations, to help team players have cohesive metrics of their in-game performance and for coaches of said teams to have insight into performance of team members. The suite consists of a Windows "companion" application that populates statistics from game sessions of a player into a database and a website for both coaches and players to view such data. It will also contain tools for the team such as coaches setting targets for players, issuing announcements and events viewable in a calendar.

TECHNOLOGIES

- .NET
- C#
- LAMP Stack
- Bootstrap 4
- Chart.JS



School Acquisition and Attendance System (SAAS)

Luke Lamplough

BSc (Hons) Computer Systems and Networks

The School Acquisition and Attendance System (SAAS) is built to aid the functions of the School of Engineering, Computing and Mathematics. SAAS provides an online portal for students to raise requisitions against an internal account and provides full workflow and accountability for authorisation and purchasing. Further, the system manages inductions into labs to meet health and safety policy. Students can then record their attendance through one of the scanning stations. This can then be viewed by students on the online portal where students can also pre-book a space within the labs.

TECHNOLOGIES

- PHP
- MySQL
- HTML
- CSS



AppyPark – Parking Made Easy

Thomas Meadowcroft

BSc (Hons) Computer Systems and Networks

AppyPark is a project aimed at addressing the problems that everyday people have with regards to parking their vehicles in public car parks due to the lack of information available. It is an android app which provides detailed free information about car parks and their location. Users can search for car parks by using their GPS location or by searching with a city name or postcode. The app will use GPS to locate the user's location and then provide a list of car parks within proximity with details on the car park such as opening times, a star rating and contact details. A search feature will also be included to allow searches by location, star rating or opening times.

TECHNOLOGIES

- Google Maps
- API
- Java
- PHP
- Android
- Apache
- MySQL



T₃ – Technical Testing Tool

Joseph Palmer

BSc (Hons) Computer Systems and Networks

Undertaking distributed technical testing, whether as part of a selection process or through academic study, is often convoluted, clunky and confusing, for both candidates and assessors. T3 is a cloud control software that integrates with AWS and creates dedicated virtual environments based on simple provisioning specifications for candidates to complete configuration or diagnostic assessments. Also managing authentication and connection brokering it provides a single end point for multiple candidates to connect to and undertake their own testing in a dedicated environment using current technologies.

TECHNOLOGIES

- Node.js
- Vue.JS
- Socket.IO
- Express
- Mongo DB
- AWS SDK

```

$ nfdump -R tcpdump/flows -s distip
ordered by -:
Duration Proto      Dst IP Addr      Flow(s) Packe
1 53
3,365 899,072 any 255.255.255.255 24( 1.0)
18 24
3,609 642,908 any 239.255.255.250 8( 0.3)
35 182
3,231 84,021 any 217.79.188.53 8( 0.3)
1243 102
3,950 5,950 any 217.79.188.10 1( 0.0)
1200 89
3,211 40,733 any 217.79.188.11 13( 0.5)
4600 91
3,114 14,059 any 217.79.188.8 4( 0.2)
1778 174
3,306 108,517 any 52.95.127.8 4( 0.2)
1541 171
3,819 604,848 any 210.239.30.117 5( 0.2)
1312 55
3,725 188,826 any 54.239.35.28 5( 0.2)
7928 651
as: 2484, total bytes: 94108261, total packets: 91827, avg by
31-05 02:13:02 - 2020-02-05 02:13:06
wd: 2484, blocks skipped: 0, bytes read: 115560
seconds: 1320231.5 balls: 0.8869, flows/second: 9716610.5

```

TECHNOLOGIES

- Tcpcdump
- Nfdump
- Nfanon



TECHNOLOGIES

- Virtualisation
- PowerCLI
- Angular
- VSphere

Application Identification from Network Traffic

Pippa Parker

BSc (Hons) Computer Systems and Networks

The internet is accessed through a vast variety of applications each day. The traffic can be captured using tcpdump and the flows can be identified using nfdump. This will provide an overview of how applications are used to browse the internet. It will also identify patterns of user activity, for example, one user may check their work emails, check Facebook messages and read the news when they turn their phone on in the morning. By understanding a user's behaviour it could be possible to distinguish between users and track their network usage without relying on IP addresses.

Virtual Machine Provisioner

Hayden Roberts

BSc (Hons) Computer Systems and Networks

Existing virtualisation platforms rely on an administrator's rights to provision a virtual machine. This project aims to allow members of an organisation varying privileges to provision their own machines as desired under the restrictions set by the administrator.



VMware Alexa Integration

TECHNOLOGIES

- VMware VCenter
- Alexa
- Python
- SOAP API
- REST API
- MongoDB

Ryan Starr

BSc (Hons) Computer Systems and Networks

In an environment where you may wish to quickly deploy virtual machines Alexa can help. With the use of voice you can deploy virtual machines with ease. Just state your requirements and Alexa will do all the work. An admin panel is available to configure the connection to the VMware Datacenter. Also included is a dashboard to monitor the resources in use (if you want to monitor the status 24/7). All of the VMware communication is done on site to avoid opening systems ports to the internet without security and with a relay server all of the technology can be contained and secured.



Syslog Snapper – Cisco Device Management Solution

TECHNOLOGIES

- ASP.NET Core 3 with Entity Framework Core
- Microsoft DHCP with DNS
- Active Directory
- VMWare
- Cisco
- Python with PExpect

Samuel Taylor

BSc (Hons) Computer Systems and Networks

Syslog Snapper allows the monitoring of Cisco devices via Syslog and SSH. Utilising Raspberry Pi SBC's Syslog Snapper can snapshot and rollback device configurations while allowing access to the console port remotely through an out-of-band internet connection. Using a centralised webpage users can view reports of device health, current status and issue commands in an easy to read, understandable manner. When considering remote branch networks Syslog Snapper can reduce engineering costs associated with network issues that typically render the remote networking devices unreachable.



Visualising Information and Data within Networks

TECHNOLOGIES

- Visual Studio
- Wireshark
- Hypervisor

Tyler Thomas-Brockman

BSc (Hons) Computer Systems and Networks

The aim of my project is to provide people with an insight to how networks and servers operate by creating a visualisation tool to capture traffic and print out information about it. Fundamentally when information is exchanged within a network or server we see it a simple button press. However, internally information goes through an intricate process of encapsulation and transport to get to its destination. These processes are what the tool will attempt to capture and in turn report to the user what it is, where it came from and where it was heading.

BSc (Hons) Computing and Games Development

Pilot

TECHNOLOGIES

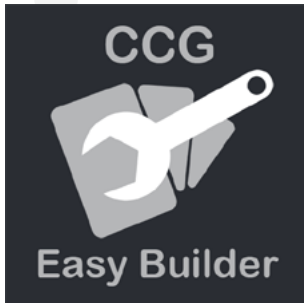
- TypeScript
- Angular 8
- SQL Server
- Node.js
- Express
- TypeORM

Pilot

Toby Bessant

BSc (Hons) Computing and Games Development

Pilot provides a consolidated, client-focused, test-case management solution. A web platform to assist in the creation, management and completion of 'user acceptance testing', phase tests from primary stakeholder perspectives, software supplier and client. Software suppliers can create suites of tests for a given project, including steps for the tests that the client-tester should take when completing the cases. The client can be invited to the project, log in and complete them online - using the in app 'suite-player' to effortlessly complete them and provide detailed feedback while doing so.



TECHNOLOGIES

- Unity
- C#
- GitHub

CCG Easy Builder

Jack Brewer

BSc (Hons) Computing and Games Development

CCG Easy Builder (CCGEB) allows users to create card games with very little programming knowledge. This tool is aimed at creatives who want to make their own card games but either don't have the skills required or the time to do so. This tool can also be used by the custom card creation community as it would allow them to set up simulation scenarios for their favourite games quickly and easily. CCGEB is designed with user friendliness in mind and can be used by people of various different experience levels. This product is a tool extension integrated into the Unity game engine.



TECHNOLOGIES

- Unity Game Engine
- ANT
- Visual Studio
- 3ds Max
- Photoshop
- Audacity

Turbo

Iain Carr

BSc (Hons) Computing and Games Development

Turbo is an engaging racing game designed to make indoor cycle training fun. By placing greater emphasis on gamification, Turbo endeavours to create an experience that rivals the passion and excitement produced by competitive racing. Action that is fine-tuned through gaming industry practices to elicit compelling emotions can provide the necessary motivation for users to hop on the bike where other applications might not.



TECHNOLOGIES

- Unity 3D
- Visual Studio
- Oculus Quest

Mechromanagement

Ryan Carter

BSc (Hons) Computing and Games Development

Mechromanagement is a VR based micromanagement game primarily for Oculus Quest. Set in a war torn cityscape the player must keep their mech functioning whilst fighting the opponent. Stop your mech from overheating by diverting coolant, putting out fires and repair systems by creating a Nano-canister. Adjust energy levels to fire, repair or cool faster.



TECHNOLOGIES

- Unity
- Autodesk 3ds Max
- Adobe Photoshop

Husk

Alicia Cordon

BSc (Hons) Computing and Games Development

Husk is a sound based psychological horror game where the player must avoid blind enemies named Husks. Husks track the player using sound, you can control your characters level of sound by holding your breath and manipulating your walking speed. Husk contains several different scenarios in its only level which are meant to evoke stress and frightened emotions from players in an unconventional manor. Once a player has finished the game they can observe reactions to these scenarios. I decided on this topic as I feel the horror market has become oversaturated with games' overuse of jump scares.



TECHNOLOGIES

- Visual Studios 2019
- Unity 2019.2.3f1
- Clip Studio Paint
- Adobe Photoshop CS6

EI Trainer

Amelia Sayaka Cutler

BSc (Hons) Computing and Games Development

High Emotional Intelligence (EI), someone's ability to manage, understand and recognise their emotions, has been shown to improve peoples' quality of life as well as better leadership abilities and success in the workplace. Currently, there exists a multitude of "Brain Training" mobile games and apps which aim to help people improve their IQ, covering skills such as memory, problem solving and focus. However, there is a distinct lack of apps and games which aim to help people train their EI despite it being something that can be trained and improved. EI Trainer will be an app comprised of scenario-based training and testing, which will help people to improve in the 5 key areas of EI: self-awareness, self-regulation, motivation, empathy and social skills. These scenarios will be based on the workplace, relationships and social gatherings. The user will also be able to see their weak areas, progress and general advice to help further improvement in their daily life. The app aims to be an accessible way for people who may not have the resources otherwise to improve their EI.



UPPERCUT!

TECHNOLOGIES

- Unity3D
- C#
- Visual Studio
- Photoshop

Uppercut!

Alexander Davis

BSc (Hons) Computing and Games Development

Uppercut! Is a 2.5D 1v1 fighting game which emphasises accessibility and simplicity while not sacrificing gameplay depth in the fighting game genre. Inspired by fighting games like Divekick, Rising Thunder and Fantasy Strike this game only has a punch, uppercut and a special move that's unique to each character. There are four characters to choose from and multiple levels to pick, choose who you like the best and fight to the death! The audience is mainly focused towards people who have never played a fighting game but want to learn how to play one.



TECHNOLOGIES

- Unity3D Game Engine
- SteamVR
- Oculus Rift S
- Visual Studio
- Blender
- C#

Necromancer Game VR

Jack Fletcher

BSc (Hons) Computing and Games Development

Necromancer Game VR is a tower defence game from the perspective of the attackers. Built in virtual reality within the Unity Engine players will dynamically create their units from body parts found throughout the world to create several classes of units, which can then be used in the tower defence event. The player must use dialogue and hints given by townspeople to formulate a strategy based on the town's units and available body parts. The game employs several types of classes which form a type of 'combat triangle'.



TECHNOLOGIES

- Unity
- C#

Procedural Map Generator

Ben Gearing

BSc (Hons) Computing and Games Development

An easy to use unity tool that will allow developers to save time and money when they want to generate large or endless maps. The user will be able to drag a prefab into a scene and generate a style of map they want by just selecting what they want from a drop-down list and set of sliders. The tool will be easy to use for newer developers and more experienced developers will be able to use the tool with even greater precision.



TECHNOLOGIES

- Unity Game Engine
- C#
- SteamVR and OpenVR
- Blender and Photoshop
- Visual Studio
- GitHub



TECHNOLOGIES

- Unity
- Blender
- Autodesk
- Sketchbook



TECHNOLOGIES

- Unity
- Visual Studio (C#)
- Photoshop
- Audacity

High Ground VR

Jack Griffiths

BSc (Hons) Computing and Games Development

High Ground VR is a virtual reality tower defence game developed in Unity. The game itself takes place on a hexagonal grid. The player can choose to view the game from the perspective of a game piece or scaled up as if the game is taking place in miniature. The aim of the project is to explore a balance between strategic tower defence combat and challenging board game mechanics through the immersive technology of Virtual Reality. The game also aims to research the gameplay opportunities available through seemingly intelligent enemies in a more strategic setting.

DM Toolkit

Nathaniel Kenji Honculada

BSc (Hons) Computing and Games Development

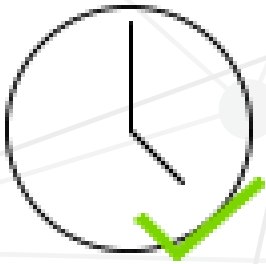
The DMToolkit is designed to make it simpler for Tabletop RPG GMs to create combat scenarios and visuals for their players wherever they may be. The DMToolkit will allow the GM to create an empty grid of their own size choice, populate that grid with obstacles, boundaries, NPCs and any other terrain. Display that scenario on screen, whether it is a mobile, tablet, laptop or computer screen. Connect that scenario via Wi-Fi and from there view statistics of all units in play as well as move any NPCs and keep track of the round number as well as the Initiative Order.

Project IGNITE

Avebry Houghton-Vowles

BSc (Hons) Computing and Games Development

Project IGNITE is a single-player 2D Combo Action game aiming to combine the stylish action of games such as Devil May Cry with the 2D platformer genre. Rather than present the player with an overwhelming number of moves the focus is on rewarding them for using their moveset in a varied and "stylish" manner. Featuring a variety of enemies with different tactics required to defeat each one. The player can acquire currency from defeated enemies that can be spent on new moves and upgrades.



ClockIn

Luke Jansen

BSc (Hons) Computing and Games Development

This is an application for small to medium sized businesses to allow them to better keep track of employee's shifts and hours and move away from paper-based systems. The current market requires either high subscription or upfront costs to implement these systems, my solution would have little upfront cost and a low subscription fee. One problem with current mobile timekeeping solutions is the ease of faking attendance which in bigger companies can go unnoticed, therefore my application will use NFC tags to ensure the employee is in the location needed to clock in as this cannot easily be faked.

TECHNOLOGIES

- Swift
- NFC
- Node.js
- Express
- MongoDB
- UWP



Dig It – Metal Detecting Simulator

Kieran Jolly

BSc (Hons) Computing and Games Development

Dig It is a game built upon my love of metal detecting and history. The aim of the game is to discover as many artefacts as you can in order to populate a museum's display. The museum will pay you for your finds which you can use to upgrade your detector as well as purchasing the rights to detect on more profitable land. Walking around the museum will allow you to view your finds as well as read about their historical significance. Many similar games lack the diversity of possible finds and I hope to rectify this by injecting a variety of my own finds over the past 8 years into the game.

TECHNOLOGIES

- Unity
- Blender
- Photoshop



GigiBox – Get the Links to Perform

Adam Lee

BSc (Hons) Computing and Games Development

GigiBox is a mobile application that looks to tackle issues surrounding establishing the connections required for Artists and Event Managers to arrange gigs and performances amongst themselves. GigiBox provides a social platform where users can match with suggested accounts using a 'Tinder' style card system and once matched, can connect and instant message. The application aims to facilitate the organisation of gigs and bringing the local music community closer together, introducing individuals that under other circumstances may not have met.

TECHNOLOGIES

- Angular 8
- Ionic Cordova
- ASP .NET Core
- Entity Framework
- MySQL



TECHNOLOGIES

- Xamarin
- SQL
- Machine Vision (CoreML)
- C#
- Networking

Snap Assure

Christopher Lehrer

BSc (Hons) Computing and Games Development

Snap Assure is a mobile application which implements the power of machine vision to create a catalogue of household items for home contents insurance evaluations. Empowering the user to make the right evaluation of their properties contents in order to save them money.



TECHNOLOGIES

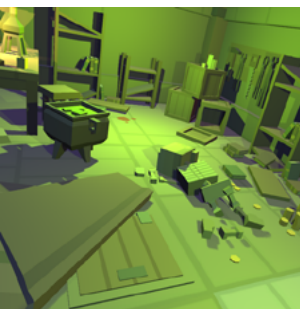
- Unity
- C#
- Audacity
- GitHub

WHO AM I?

Alexandru-Catalin Marcu

BSc (Hons) Computing and Games Development

WHO AM I? It is a psychological game developed in Unity3D aimed to help people to get a better understanding of themselves. We are going to have a trip inside your mind where the voice inside your head is going to guide you through an adventure full of mysteries waiting to be discovered. The reward? A mystery that only the person playing it can find, it is different for everyone, based on their choices. When combining psychology and games the only limit that you have is your own mind and imagination.



TECHNOLOGIES

- Unity
- C#
- JetBrains Rider

Synthetic Dungeon

Kacper Mazur

BSc (Hons) Computing and Games Development

A mobile top down action RBG game like titles such as Diablo and Path of Exile. Where focus is on game optimization pushing the limit on enemy density and their behaviours. Procedurally generated dungeons with a ladder system that challenges the player to complete them with competitive time frame. Runtime Spell creating system giving the player ability to create up to 1,000 or more different spell variations. Item builds that improve spells and players base stats. Build for IOS and Android.



TECHNOLOGIES

- Adobe Photoshop
- PlayStation 4
- Xbox One
- Unity3D
- C#

Momentum [Console Edition]

Liam McFadyen

BSc (Hons) Computing and Games Development

Momentum is a gravity defying platform game which takes on a retro arcade style. Push through the level based platformer in an attempt to avoid the dark forces that cross your path. Development has been carried out for the latest and next generation of video games consoles which will be launching in Q2 2020. Compete with leader boards, unlock achievements/trophies and compare statistics on the way to obtaining that 100% completion rate. Future DLC content will be available shortly after release of the game.



TECHNOLOGIES

- Unity
- Visual Studio (C#)
- PicaVoxel

Commanding Events to Conquer Complexity

Jake Morgan

BSc (Hons) Computing and Games Development

One of the biggest pitfalls with beginner developers in Unity is getting objects to interact in their levels. Poor implementations can lead to very clunky and confusing UIs, poorly laid out and inefficient classes, and the dreaded God-Methods. This tool is designed to help fight that. By introducing a sleek and easy to use custom event system, new developers are encouraged to encapsulate their code and tidy up their inspectors. No more ten object references just to turn on some lights! Now even complex levels can be run much more smoothly with very little extra work required from the developer.



TECHNOLOGIES

- Unity
- VR
- Photon Unity Network

Deep Space Dilemma

Connor Priest

BSc (Hons) Computing and Games Development

A co-op virtual reality shooter where a group of players will work together to repair a space station by completing a series of tasks. Play with up to 5 other players over the internet via matchmaking or joining a private game using a unique map interaction interface. Fight your way through enemies using a range of weaponry and navigate through several rooms, but beware as someone on the team may be working against the rest of the team and will be attempting to sabotage the mission. Inspired by games such as Battlestar Galactica board game, Werewolf, Among Us and Trouble in Terrorist Town.



TECHNOLOGIES

- Unity 3D
- Steam VR
- Visual Studio 2019
- HTC VIVE
- Audacity

Learn to Cook VR

Dominic Reader

BSc (Hons) Computing and Games Development

Learn to Cook VR (LTC VR) is a cooking Virtual Reality (VR) game that aims to be fun whilst allowing the user to learn basic concepts that can be translated to a real world environment. Work your way through four different rooms with different recipes each with varying difficulties, the better you do the higher you will score and hopefully the more you will learn. At the end of the play through there will be a quiz to test how much you have learnt through the game so pay close attention to the actions you take.



TECHNOLOGIES

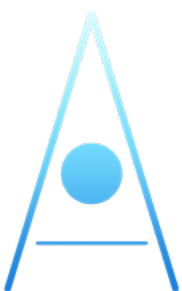
- Unity
- 3Ds Max
- Visual Studio
- C#
- Trello

Mystic Mastermind

Jack Saull

BSc (Hons) Computing and Games Development

A magic themed 3D puzzle platform where the player must explore and navigate through an abandoned and dangerous underground facility, and with the use of their elemental magic, avoiding dangers and obstacles to reach the end portal.



TECHNOLOGIES

- Unity
- C#
- GitHub

Aqua – Novel Player for Novel Games

Timothy Seow

BSc (Hons) Computing and Games Development

Aqua Novel Player is like a "media player" for novel games. Similar to how videos have a video player to play/render the contents of a video file. A Novel Player can play/render the contents of a "Novel Package". Creating a novel can be as simple as a single .txt file or with the custom "Aqua Novel Editor". No programming knowledge required with support for images and audio. The scripting language that Aqua interprets is similar to KAG/Kirkiri, a popular visual novel engine in Japan. Make simple short stories or long stories with branching narratives, your imagination is the limit.



Fibre – Automated SCM Client for Git and Mercurial

Toby Smith

BSc (Hons) Computing and Games Development

Fibre is a source control client with a focus on repository management and automation. All the buttons in the user interface are dynamically set by the user and each run a different script which the user creates. These scripts are written in TypeScript or JavaScript and are themselves stored in repositories. Users can share scripts with others or store them in a company-wide repository for professional settings. These scripts can handle automation tasks including working with the repository, the file system, as well as talking to DevOps, issue-tracking and repository hosting platforms.

TECHNOLOGIES

- Node.js
- TypeScript
- Angular 9
- Electron



Fresh Start

Luke Vanstone

BSc (Hons) Computing and Games Development

Fresh start is an Interactive sandbox showcasing AI. With a core focus on a needs-based system which the AI is tasked to fulfil. This is represented in moods which display the needs of a NPC showing how these needs are being fulfilled within a simulated environment. Users can interact with the world and make changes which the AI will be able to interact with, adapt and overcome creating a dynamic sandbox experience. AI's have diverse behaviours allowing a unique ecosystem which allows pathing, environments and interactions to change the way in which they will interact with the world.

TECHNOLOGIES

- Unity3D
- Intellij
- C#
- Platform: PC
- Volumetric Lighting



Audiomata

Pharez Vitalis

BSc (Hons) Computing and Games Development

Audiomata compliments Unity's audio system by wrapping all changes to an audio signal or group of audio signals into 2 components - an event system and a tagging system. The tagging system allows audio clips to be combined in different ways so that the tracks can be called upon and changed responsively during gameplay, this allows procedural music and dynamic sound effects. Finally, the event system allows developers to apply changes to the audio signals during gameplay using filters, snapshots and direct property modifications, automating the process of in game audio signal changes.

TECHNOLOGIES

- C#
- Unity



TECHNOLOGIES

- Unity
- Blender
- C#
- Photoshop
- GitHub
- Trello



TECHNOLOGIES

- Unity
- Visual Studio
- C#
- 3dsmax
- PhotoShop

Shutterbug

Aden Webb

BSc (Hons) Computing and Games Development

Shutterbug is a cryptid photography game where the player explores a relaxing environment and tries to get the perfect shot. The player takes on the role of a freelance photographer snapping credible photos of cryptids. To make the photo more believable it needs to be backed up with proof which can also be found in the world! The player will be exploring an environment, finding evidence and slowly learning each creatures' quirks so they can be tracked even easier in future. With inspirations like Pokémon Snap, Shutterbug aims to be a calm experience that can be played in short bursts.

TinyToyCity

ShiChun Yu

BSc (Hons) Computing and Games Development

Tiny Toy City is a classic 3D Point Click RPG game. The player just needs to use their mouse to play this game. Seems easy, but there are a lot of puzzles like treasure hunt, water pipe games and reasoning being to solve by the player. Those puzzles consist of the game story, so the player has to solve it to evolve. The game is a third-person game. The camera of the game like CCTV catches the player's position at a specific place. Focusing on the coordination between the puzzles and the story lets the player feel like they are really part of the game.

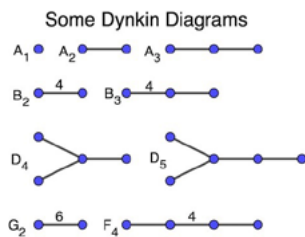
BSc (Hons) Mathematics



'A TROPICAL CURVE'

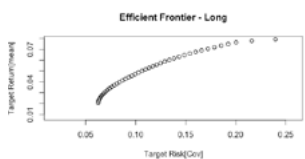
TECHNOLOGIES

- LaTeX
- GeoGebra



TECHNOLOGIES

- LaTeX
- GeoGebra



TECHNOLOGIES

- LaTeX – Overleaf
- RStudio

Tropical Geometry in \mathbb{R}^2

Katarzyna Jagoda

BSc (Hons) Mathematics

Tropical Geometry – sounds exotic! The name of this new area of mathematics was given in honour of its founder, Imre Simon, Brazilian mathematician. It is the study of geometric objects which include tropical lines, curves and higher dimensional shapes. Tropical curves in the plane look very different to classical curves and are made up of straight lines. Despite this, they retain many properties familiar to classical geometry e.g. the tropical curve given by a quadratic equation intersects a tropical line in at most two points. In fact, complicated classical constructions can be converted to the much easier tropical objects to analyse. Therefore, tropical geometry is of interest to mathematicians.

Classification of Finite Reflection Groups and Lie Algebras

Callum Page

BSc (Hons) Mathematics

Given an irreducible finite reflection group or simple Lie Algebra we can associate vectors in a vector space called roots, these roots form a set called a root system. A particular subset of the root system is called a t-base and we can associate to the t-base a Dynkin diagram, which is a graph with vertices and edges. Since there are a finite number of classes of Dynkin diagrams, this process allows us to classify the irreducible finite reflection groups or simple Lie algebras. We have focused on the irreducible type since all finite reflection groups can be written as a product of irreducible ones. Similarly, any semisimple Lie Algebra can be written as a product of simple ones.

Portfolio Optimisation

Kimberley Randall

BSc (Hons) Mathematics

This project investigates how Markowitz's Modern Portfolio Theory relates to modern day finance. Research has shown that from the risk and return determined in the portfolio theory, investors can optimise their profits when investing in assets. By applying different constraints to the problem a lot can be achieved, this makes the problems very interesting. The main finding from the research is the Efficient Frontier Curve, which plots the portfolios on a graph for investors to visualise the optimum portfolios. From this research it was found that the Markowitz Modern Portfolio Theory is incredibly useful and can be used in many ways by investors to enable them to find the best investments.



TECHNOLOGIES

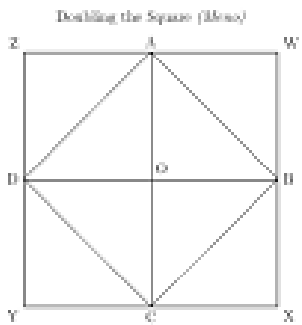
- LaTeX – Overleaf
- Word
- Maple
- MATLAB

Modelling Baroclinic Instability

Louisa Spearing

BSc (Hons) Mathematics

I will introduce the Coriolis Effect and the β plane approximation as well as introduce many aspects of geophysical fluid dynamics that are essential in investigating baroclinic instability. Firstly, I will look into the β plane approximation as well as Rossby waves and the importance of potential vorticity. With these things in mind we can then start to derive the quasi-geostrophic potential vorticity equation (QGPVE) using a spherical polar coordinate system. The two main models of baroclinic instability are then introduced that both use the QGPVE, but with different conditions that affect how instability is determined. Investigations into the conditions on instability within each model are then evaluated.

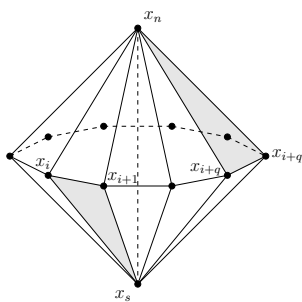


Mathematical Constraints and Their Philosophical Impact

Adam Stiles

BSc (Hons) Mathematics

This project investigates some of the constraints encountered in mathematics. It proves the incompleteness theorems. It investigates or discusses theorem proving procedures, complexity, undecidability, undefinability, and covers some examples of independent formulas. Some dialogue on the influence of these concepts on the development of mathematics and on mathematical philosophy since the 20th century is included. This project should give any person with an interest in philosophy sufficient understanding to discuss mathematical philosophy with mathematicians.



TECHNOLOGIES

- Topological Invariants

The Significance of Lens Spaces in the Development of Topology

Charles Twigger

BSc (Hons) Mathematics

This paper concerns a class of topological spaces called lens spaces. They were first studied at the beginning of the 20th century and serve as important examples and counterexamples in the determination of topological invariants – properties of topological objects that stay constant between similar objects. This aspect of the field of topology has wide reaching applicability in studying abstract structures, from neuroscience and molecular biology to computer science, and this project considers the impact that these particular spaces have had on our understanding of it.

BSc (Hons) Mathematics and Statistics



Approaches to Solving the Wind Farm Design and Optimisation (WFDO) Problem

Pawel Manikowski

BSc (Hons) Mathematics and Statistics

The demand for renewable energy has increased in recent years. The energy extracted from the wind is considered to be the most popular source. This paper discusses the idea of wind farm design and optimisation problem. Jensen's wake model was examined and implemented. A squared shaped wind farm was proposed with a discrete location of the wind turbines. For the optimal positioning of wind turbines three algorithms were introduced: deterministic, random and Monte-Carlo. The best performing one was chosen and used for optimisation.

TECHNOLOGIES

- Python
- LaTeX
- GeoGebra

BSc (Hons) Mathematics with Finance



Optimisation – Resolving the Quantity Satisfied vs Demands Satisfied Problem

Daniel Wilson

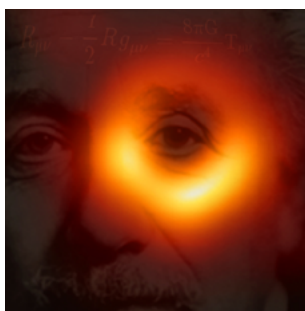
BSc (Hons) Mathematics with Finance

The original idea for my project, which I was given by Babcock, was to conduct a literature review of solutions to optimization problems and use the best selection of these solutions to solve an altered subset of a real commercial data set. The motivation for this came from their desire to know if there was an optimal way to arrange their stock in order to achieve the highest demand and quantity satisfied at the same time as maximising profit by reducing cost.

TECHNOLOGIES

- Excel VBA
- LaTeX

BSc (Hons) Mathematics with Theoretical Physics



Einstein's Field Equations

David Aspden

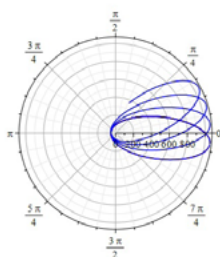
BSc (Hons) Mathematics with Theoretical Physics

In 1915, building on his successful theory of Special Relativity, Einstein produced the General Theory of Relativity. This advanced many ideas in mathematics to arrive at his final Field Equations. This is a project of discovery and appreciation of the efforts it took to get to the final theory. I derive many of the results along the way that enabled this next level insight. In 2019 we announced, as a species, our first ever image of a Black Hole. We now regularly detect Gravitational Waves. All these are predictions of this vast, complicated set of Non-Linear partial differential equations; the Einstein Field Equations that describe the fabric of space-time.

TECHNOLOGIES

- Maple
- LaTeX
- Illustrator
- Photoshop
- Whiteboard

Trajectory of a massive particle with corrections from general relativity



TECHNOLOGIES

- Maple – Software for Mathematics

General Relativity – Formalism and Applications

Daniel Coles

BSc (Hons) Mathematics with Theoretical Physics

General Relativity was published in late 1915 and since then has had significant implications and applications on some of the most important inventions of the 21st century, namely GPS which would otherwise have a significant margin of error. The formalism of general relativity entails understanding the mathematical language the theory is written in, alongside advanced mathematical ideas. One application I studied was the discrepancy in the perihelion of Mercury, the point in the orbit which is closest to the Sun. The perihelion advance is demonstrated in the plot I have produced. The trajectory is elliptical unless you account for general relativity then you observe a precession.

Thank you to our supporters

We thank you for taking the time to support the SECaM Project Showcase 2020 and hope that this has shown the difference that industrial partner participation and engagement is making in the preparation of our University of Plymouth students as the next generation of industry professionals.

The School of Engineering, Computing and Mathematics wish to thank the sponsors of the Student Projects, our External Examiners and all who continue to support our students and staff.



COMPUTING

- British Computer Society (BCS) accredited degrees
- Employers of our graduates include: Cisco, GCHQ, IBM, the Met Office and QinetiQ
- Cutting-edge research
- 71% of research graded as 'world leading' or 'internationally excellent' (REF, 2014)
- Placement employers include: BBC, BMW, Hewlett Packard and GlaxoSmithKline

Courses for 2020

BSc (Hons) Computer Science

BSc (Hons) Computing and Software Development

BSc (Hons) Cyber Security

BSc (Hons) Games Development Technologies

BSc (Hons) Computer Science with Foundation Year

MSc Cyber Security (full-time, part-time route available)

MSc Data Science and Business Analytics (full-time, part-time route available)

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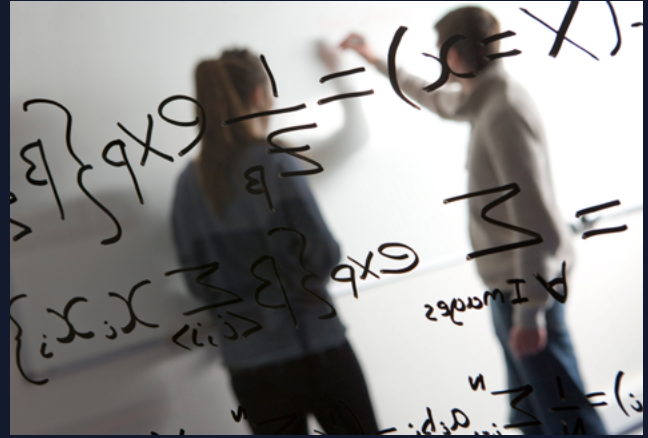
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MATHEMATICAL SCIENCES

- Ranked 4th in the 2020 *Guardian* Mathematics University League Table
- 68% of research graded as 'world leading' or 'internationally excellent' (REF, 2014)
- Placement employers include BMW, BT, Collins Aerospace, National Air Traffic Services and MasterCard
- Employers of our graduates include Babcock, CERN, KPMG, the Oxford Clinical Trials Unit and Siemens
- The Institute of Mathematics and its Applications (IMA) accredited degrees

Courses for 2020

BSc (Hons) Mathematics

BSc (Hons) Mathematics and Statistics

BSc (Hons) Mathematics with Education

BSc (Hons) Mathematics with Finance

BSc (Hons) Mathematics with Theoretical Physics

BSc (Hons) Mathematics with Foundation Year

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