

School of Applied Computing

Major Project Titles

February 2019

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Dr Mabrouka Abuhmida

Project title	Block-chain and Smart Contracts
Project type (Delete as appropriate)	Development / Experiment/ Theory
Target degree lines (Delete as appropriate)	SE / WD/ CNets/AC
Despite the growing hype on blockchains and smart contracts, the understanding of their trustworthiness and security has still to be assessed. Programming languages in early blockchains, such as the Bitcoin scripting language, were deliberately limited to reduce complexity for the sake of security. This limitation motivated the launch of a new breed of platforms, such as Ethereum, that can theoretically support every application. However, this enhanced functionality introduces new security challenges related to language design and secure programming practices. In this project, the student will provide an in-depth overview of the vulnerabilities and attacks on Ethereum smart contracts, but will also learn how formal methods can be used to detect these vulnerabilities. If time allows, the student will analyse and formally verify an Ethereum smart contract. 1- To review smart contracts vulnerabilities and best practices with related experiments. 2- Another is to review various DLT frameworks and compare those using relevant test cases. 3- A third one it to analyse applications of DLT in the real world, and systematically develop and evaluate an own application.	

Project title	Harry Potter make it yourself wand (IoT)
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE/ WD/CNts/ELEC
Gesture recognition for control of IoT devices. This project will comprise of making a kit available for anyone around the world to make their very own wand gesture recognition system. It will involve investigating existing hardware to build the sensor, e.g. raspberry pi and infrared cameras etc. And building an ML algorithm that is capable of recognizing several waving gestures of the wand using the images / videos captured with the infrared camera. If time allows the project could also implement an IoT proto-call to active IoT device with the wand. Interactive Smart Home Using Indoor Photovoltaic Gesture. • You can developed a self-powered indoor photovoltaic gesture sensor. • Or integrate these sensors with wireless networking and build an internet of things (IoT) smart home that can control various appliances such as TV and cooker with shadow based remote midair gestures of occupants.	

Project title	Wireless Sensor Networks based Tangible Input Devices for Human-Computer Interaction
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CNets / SE/ELEC
In this project, you will build tangible input devices which communicate with each other as wireless sensor nodes. The relative orientation of the devices will be sensed as input to the computer to zoom, pan and rotate data sets for exploration and discovery. The tangible input devices will have haptic feedback and visual notification. They could be also integrated with small robotic modules for data visualisation if time permits.	

Project title	Improving Early Diagnosis of Cancer using Cloud Computing
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE /AC
Nearly half of all cancer incidences in the UK are diagnosed at late stages, resulting in low survival rates and high costs to the health services. Timely non-invasive detection of cancer biomarkers in body fluid such as blood serum and urine can improve survival rates as well as save costs. We aim to develop a multi-site digital molecular diagnostic platform to detect cancer biomarkers at early stages with high reliability, specificity and consistency. The novelty of the work includes cloud computing and data science to bolster existing molecular methods e.g. Raman and mid-infrared absorption spectroscopy that are emerging from laboratory space to the clinical space.	

Project title	Bacterial cyber security (moving target defence)
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CNets/SE /AC
Antibiotic resistance in bacteria has evolved to be both efficient and effective. It achieves this by switching its resistance on and off to save energy. Can we learn from this process to establish a new form of moving target defence for cyber security? Recommended reading: D. John et al. (2014) "Evolutionary based moving target cyber defense", Proc. GECCO '14. Available: https://dl.acm.org/citation.cfm?id=2605437	

Project title	Augmented reality as a pedagogical tool
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC / SE / WD / Games
Augmented Reality, a bleeding edge technology that has been used to improve all aspects of society from tourism and sight-seeing to military training. This technology that overlays virtual 3D objects in a real world environment has only been touched upon in the world of academia. This project aims at creating an iOS application that incorporates Augmented Reality allowing a user to take advantage of features that cannot be found in today's educational curriculums. A user will be able to tap into a variety of learning mediums such as visual, kinaesthetic, auditory and verbal to enhance the learning process. The application provides a visual representation of the Solar System and the Universe including complex features developed in Unity such as the formation of the Milky Way to a modern immersive user interface using touch navigation. Interstellar AR allows a user to seamlessly explore different parts of the Universe and discover information in a variety of ways. It is anticipated the next step of the project will integrate a collaborative workspace allowing users to essentially share an environment. In this project you will build an AR based educational application and maybe you can test it in one of the local schools.	

Project title	Autonomous cars
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC / SE / CNETS / Games/ ELEC
The field of autonomous automation is of interest to researchers, and much has been accomplished in this area, of which this paper presents a detailed chronology. This paper can help one understand the trends in autonomous vehicle technology for the past, present, and future. We see a drastic change in autonomous vehicle technology since 1920s, when the first radio controlled vehicles were designed. In the subsequent decades, we see fairly autonomous electric cars powered by embedded circuits in the roads. By 1960s, autonomous cars having similar electronic guide systems came into picture. 1980s saw vision guided autonomous vehicles, which was a major milestone in technology and till date we use similar or modified forms of vision and radio guided technologies. Various semi-autonomous features introduced in modern cars such as lane keeping, automatic braking and adaptive cruise control are based on such systems. Extensive network guided systems in conjunction with vision guided features is the future of autonomous vehicles. It is predicted that most companies will launch fully autonomous vehicles by the advent of next decade. The future of autonomous vehicles is an ambitious era of safe and comfortable transportation. In this project we will develop a self-driving car based on machine learning or neural network algorithms.	

I am open to any other good ideas from students, please approach me with your ideas and let us discuss it.

Dr Kemi Ademoye

Project title	Design Patterns in Web Application Development
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	
This project will investigate the use of design patterns e.g. software and architectural design patterns in enterprise web application development. It could be a comparison of design pattern techniques or a single or combination of patterns could be chosen for implementation and analysis.	

Project title	Security in Web Applications
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	
This project will investigate security in web application development. The OWASP Top 10 lists the most prevalent and dangerous threats to web security in the world today and is reviewed every 3 years. The project could investigate the approach to securing a web application following these guidelines and validating your implementation against the framework.	

Project title	Bluetooth Low Energy (BLE) Beacons
Project type (Delete as appropriate)	Experiment/Development
Target degree lines (Delete as appropriate)	
This project will explore the use of Bluetooth Low Energy beacons for creating location and proximity experiences or tracking. For example, the project could explore creating such experiences within the University.	

Project title	JavaScript Frameworks and Libraries e.g. React and Angular
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	
JavaScript frameworks and libraries are very popular among front-end web developers. This project could be a comparison of two different technologies or a single one could be chosen for implementation and analysis.	

Project title	Progressive Web Apps
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	
This project will investigate progressive web apps, an alternative to mobile apps that is gaining popularity.	

Project title	SQL vs. Non SQL Databases
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	
This project will investigate the use of traditional SQL databases and non-SQL approaches. This project would involve a comparison of the two different techniques in a development project.	

Project title	Other Projects Areas of Interest
Project type (Delete as appropriate)	
Target degree lines (Delete as appropriate)	
- Existing/New trends and techniques in Web Development, Mobile App Development - Databases and data management/analysis/integration - Application of new interfaces and creating multisensory experiences in user applications	

Project title	Multisensory Experiences
Project type (Delete as appropriate)	Experiment/Development
Target degree lines (Delete as appropriate)	
This project involves exploring the use of multiple sensory modalities beyond sound and vision to create multisensory media experiences to enhance the user's Quality of Experience (QoE) e.g. exploring the development and use of multisensory media experiences in education and entertainment.	

Project title	3D Mesh Morphing
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
The aim here is to build upon previous work undertaken at the University to develop a 3D morphing solution for two objects that contain different numbers of vertices. Previous studies have proven successful in morphing two non-uniform objects into a single data-set. However, more research is required to identify / implement and test an alternative topologization algorithm needed to re-triangulate the merged data-set after the morph has taken place	

Project title	Real-time adaptive LOD management system using PS4 Virtual Reality headsets
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
Explore suitable solutions to real-time adaptive LOD (level of detail) management systems based on the viewer's point of fixation... i.e. update the level of detail for each individual object within the scene based on where the viewer is currently looking. This project may make use of the Universities PS4 Development Kit and VR headset	

Project title	Explore solutions to increase the users depth awareness during game play using Depth of Field Blur
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
The CG camera is based on a pinhole camera (i.e. without a lens). Images captured using a pinhole camera has an infinite depth of field (DOF). This results in all objects within the scene appearing sharp and in-focus. This produces images that appear fake / too perfect. The aim of this project is to evaluate various approaches taken to add lens-based DOF blur to an existing computer generated image. The student may wish to tackle this problem using either the PS4 or OpenGL's shader language.	

Project title	Deferred Rendering Technologies
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
This project explores Deferred Rendering – an alternative approach used by triple AAA games titles (such as Assassin’s Creed III) to render scenes with large numbers of light sources. Traditionally a <i>Forward Rendering</i> approach has been used to render graphical scenes for decades. However, Forward Rendering is highly inefficient when used to render a scene that contains many light sources. Deferred Rendering is a screen-space rendering technique.	

Project title	Ambient Occlusion / Self Shadowing Objects
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
This topic focusses on the exploration of various self-shadowing techniques currently used in real-time games development to improve on the standard hard-lighting model. Self-shadowing algorithms have been used to create realistic soft shadows in high end graphical applications (Animation) for many years. However, due to technological advances in graphics card programming, ambient occlusion can now be incorporated in real-time	

Project title	Ray Tracing for Games
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
Until recently, ray tracing has been considered far too computationally expensive for real-time graphics applications. The rapid expansion in graphics card technologies has enabled the games programmer to integrate ray tracing within real-time games. The student will initially undertake research into these newly emerging technologies with a view to implementing a real-time ray tracing programme using OpenGL API	

Project title	Animating articulated structures
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
This topic compares forward and inverse kinematics commonly used to animate bipedal CG characters in real-time computer graphics systems.	

Project title	Animation Control using Parametric Curves
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
The use of parametric curves has been used to control the movement of simple objects and/or complex articulated structures within games for many years. The student will investigate ways in which splines can increase the realistic motion of both simple and complex structures.	

Project title	Procedural Texturing using the PS4 Shader Language (PSSL)
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
Shader development allows the programmer to write small programs to control low-level raster scan operations on a per pixel basis. During this project, the student will use the Playstation 4 Shader Language to apply a procedural texture to a 3D animated mesh.	

Project title	Volumetric Shadows
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Games / SE
The aim of this project is to explore various approaches used to create volumetric lighting in real-time games environments. This project could be a comparison of techniques commonly used, or a single technique could be chosen and implemented using graphics shaders.	

Project title	Benchmarking of high performance computing clusters
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	
• Development of an application which can be run on clusters to assess score in four key areas: - o CPU speed - o Memory available - o Disk space available - o Network load capacity and latency • Possible scope for comparing CPU and GPU clusters through a single application • Generation of some sort of “score” at the end, along with suggested improvements to eliminate bottlenecks • Will require fluency in C/C++ or FORTRAN and a modicum of networking ability	

Project title	Mixed mode parallelism - programmatic elicitation of optimal combinations of parallelism method(s)
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE
That is simultaneously implementing two or more methods of parallelism, e.g. cluster processing and threading, or threading and GPGPU • Automatic code analysis to discover which portions (if any) of a specified code sample would benefit best from parallelism methods, including cluster processing - o Could include runtime analysis as an advanced feature to spot SIMD operations • This is very similar to some Intel software that already exists named Intel Advisor XE – I want someone to do it better • The real crux is code analysis, be it pre-compile or at runtime	

Project title	Automatic parallelism of embarrassingly parallel problems
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE
• Code analysis resulting in automatic modifications to thread appropriate sections. • Large scope for iterative development; could be relatively simple or extremely advanced. ○ Could include more than one method of parallelism. ○ Potential for inclusion of synchronisation. ○ May investigate less trivial problems.	

Project title	Structured code analysis to grade code against best practice specifications and recommend improvements
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE/CIS/WD
• Code analysis resulting in a report of how well code measures up against best practice specifications. ○ May include a “grade” by way of a percentage. • Suggestions for improvements to better meet best practice. ○ Automatic implementation of these modifications could be considered as an advanced feature.	

Project title	Exploration of the CUDA framework around implementation boundaries
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	GD/SE
• Revolves around the implementation of an algorithm (potentially of the student's choosing) which involves the transfer of large arrays between the graphics and system memory • Analysis of bottlenecks pertaining to this and how they limit performance gains • Development of a framework for recommending parameters for CUDA-based algorithms	

Project title	Securing the Wireless Sensor Network
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD
The aim of the project is to have a live Wireless Sensor Network implementation in the School of Applied Computing. The application of the network can vary but must incorporate a number of nodes and sensors that can be attacked utilising established techniques. A secondary aim would be to identify what can be done to secure the network against these attacks. • The main objective is to perform penetration tests on a wireless sensor network in a physical environment, demonstrating the vulnerabilities • Simulation of the wireless sensor network for testing should be considered but must follow the same blueprints of the physical design. This will ensure the integrity of the simulated network against the physical results obtained. • The project must perform at a minimum three attack strategies and compare and contrast the expected results to the actual.	

Project title	SMART Building(s) utilising IoT and WSNs
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD

The aim of the project is to create a simulation of an Office structure utilising both Wired and Wireless solutions. The implementation of the network can vary but must incorporate a sensor network to monitor the occupancy, building environment and provide security for an external car parking area.

- The main objective is to utilise simulation software to fully implement a working enterprise network. The design must include a WSN and IoT devices that manage and maintain the building.
- One of the main concerns for the project will be around the recording of occupancy as the companies have a number of floors and different departments. The main reason for this is to record attendance for Fire Safety reasons.
- The simulation must consider the necessary protocols and standards required.
- The network design at a minimum must consider the following;
 - o Delay / Fade / No Fading
 - o At least 5 floors to be used
 - o Packet Loss / Throughput
 - o Applications to be used – SMTP, HTTP, FTP, DHCP etc.
 - o IP Addressing scheme – VLANs, IPv4 & IPv6
 - o Wireless Sensors
 - o Access points
 - o Building Management
- The report must identify suitable technologies and devices used within the network and justify as to why they are suitable

Project title	Smart Patient Tracker using IoT
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD

The aim of the project is to create a network that can be used to monitor patients. They could be located at home, hospital, care home or generally out in town. Considerations should be given as to the patient's confidentiality but also continued connection with a network. The successful implementation of this project must consider the following;

- What information is being transmitted
- Potential for data loss or delay in transmission
- What protocols to use?
- Current devices and their application
- Type of network
- Physical vs Simulation implementation
- Alert systems for Patients in distress and lost

Should the project be able to physically implement a small test bed network? The results must be benchmarked against similar projects and if possible any simulated designs.

Project title	Smart Campus and Internet of Things (IoT)
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD
The aim of the project is to have a live implementation in the School of Applied Computing that that will utilise WSNs to manage classroom environment; this may include automated heating, light and window control, attendance monitoring, manage and monitor lights, temperature, carbon dioxide, humidity in a room. • The main objective is to implement a test a wireless sensor network in a physical environment, so that it can control light and heating systems. • Create a simulation of the wireless sensor network, following the same blueprints of the physical design, so that fair simulated results can be obtained. • Create a management device for the wireless sensor network, by using a Raspberry Pi. • Implement a two phased experimental approach, so that single and dual channel scenario findings can be evaluated and compared.	

Project title	Smart Campus and Internet of Things (IoT)
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD
The aim of the project is to use appropriate simulation tools: 1. to implementation in the School of Applied Computing a WSNs system that that will manage classroom environment; this may include automated heating, light and window control, attendance monitoring, manage and monitor lights, temperature, carbon dioxide, humidity in a room or 2. use of wireless sensor networks to implement smart car parking The overall aim is to create a better experience for students and staff, achieve cost and risk reductions, improve performance, flexibility and efficiency.	

Project title	Performance Comparison of routing Protocols
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD
The aim of the project is to use appropriate simulation tools: • To carryout performance comparison between two or more routing protocols such as AODV, DSR, DSDV etc. for either WLAN, MANet, WSN using metrics such as Delay, Jitter, Throughput, delivery ratio, etc.	

Mike Dacey

Project title	Backbone.js
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Study the effectiveness of a JavaScript MVC framework “Backbone.js” in building mobile applications, by developing and testing an application for mobile devices. The application should also integrate twitter bootstrap to produce a responsive web design.	

Project title	Smart Campus and Internet of Things (IoT)
Project type (Delete as appropriate)	Development / Survey / <u>Experiment</u> / Review
Target degree lines (Delete as appropriate)	BIT / CG / CIS / <u>CNets</u> / SE / WD
The aim of the project is to have a live implementation in the School of Applied Computing that that will utilise WSNs to manage classroom environment; this may include automated heating, light and window control, attendance monitoring, manage and monitor lights, temperature, carbon dioxide, humidity in a room. • The main objective is to implement a test a wireless sensor network in a physical environment, so that it can control light and heating systems. • Create a simulation of the wireless sensor network, following the same blueprints of the physical design, so that fair simulated results can be obtained. • Create a management device for the wireless sensor network, by using a Raspberry Pi. • Implement a two phased experimental approach, so that single and dual channel scenario findings can be evaluated and compared.	

Project title	Multiplayer Games
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Develop a multiplayer game and explore the process of synchronising object between the client and server. The results of this project should be an exploration of the methods that are used in such games and the performance of each technique i.e. amount of data sent, delays, etc. An existing game server may be used.	

Project title	Web 3D
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Use blender to create 3d assets as used in movies and games. Study the methods used to import these models into 3d applications and investigate how these models are best displayed on the web e.g. using three.js (WebGL). Alternatively, you may compare and contrast different methods, technologies, and libraries for displaying and interacting with 3d objects on the web e.g. Unity vs WebGL.	

Project title	Node.js
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Use node.js to develop a web application and REST based web service using a MongoDB database. What are the benefits and drawbacks of using node.js, and does it have an advantage over PHP when dealing with JSON data.	

Project title	Web Design for Small Screen Devices
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Investigate the best approach to mobile design, with specific focus on “mobile first” design principles. Construct web applications that demonstrate the design process from first principles, beginning with wire frame layouts. This project must include an investigation of the best method to test these designs across a range of devices.	

Project title	Augmented Reality for Mobile Devices
Project type (Delete as appropriate)	Development/Study
Target degree lines (Delete as appropriate)	CIS / SE / WD
Hypothesis: Augmented reality will change the way we interact with the world. Study the use of augmented reality (e.g. Google Glass) and determine the how this technology changes the design rules for application development. Design and build an application demonstrating the effectiveness of augmented reality.	

Project title	Client side performance
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Study the techniques used for increasing the performance of web applications e.g. by minimising and compressing JS files, asynchronous loading of JS files (e.g. Require.js), etc. Measure and analyse the effectiveness of these techniques.	

Project title	Asynchronous Web
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Why multithread server side code for web applications? Study the technologies and techniques used to determine what benefits they bring and the types of applications that need this approach. Build an application that demonstrates the correct approach to designing and building multithreaded web applications. You may choose to compare and contrast different technologies.	

Gordon Dickers

Project title	Language Teaching App Evaluation
Project type (Delete as appropriate)	Survey
Target degree lines (Delete as appropriate)	All
The aim here is to investigate a subset of existing language teaching software applications and to evaluate them identifying strengths, weaknesses, approaches, etc. You would be expected to create a small study to compare the effectiveness of two leading apps e.g. DuoLingo and Rosetta Stone so it will involve finding at least one other willing participant and the desire to learn a new language!	

Project title	Steganography – the art and science of hiding messages within messages.
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE, Web, CIS, Mobile, Nets, Games
The aim here is to investigate steganography methods and to develop steganographic software that can hide a text message within an image. It would also involve a review of existing software and methods. Would suit any student who has studied C, C++, C#, java, etc.	

Project title	A.I. car controller
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE or Games
Previous students have developed a Unity Based Car Test Track that can generate and log all the car physics and control data for a race car. The aim of this project is to use the test track to log data and to then develop, train and evaluate a supervised learning algorithm (for example Naive Bayes, Neural Networks, etc.) that can autonomously control a race car. Several versions of this project are available.	

Project title	AI Pathfinding
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE, Games, CIS, Mobile
Finding the best path through a dynamically changing environment and navigating this path in a realistic manner is an important goal for a good Game AI bot. You will review existing methods, select approach(es) suitable for a given game genre, implement and evaluate your solution(s).	

Project title	Agent Based Modelling
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE, Games, Web, Mobile, CIS.
Agent Based Modelling (ABM) is used to investigate the emergent properties of systems made up of thousands of interacting agents that follow a simple set of rules. Examples of systems simulated using ABM include epidemiological studies that model the spread of smallpox in a population; crowd panic scenarios and the famous “El-Farol bar” problem. Some well developed software tools such as Repast and NetLogo are used by many researchers and you would be expected to use one of these ABM tools to model one of several world problems. Please contact me for details. Several projects available.	

Project title	Teaching through Motivation in Video Games
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	All streams
The use of computer games to facilitate teaching and learning has become fashionable in e-learning systems in part because it can motivate students to learn by satisfying the need for competence, autonomy and relatedness. This project aims to identify and evaluate the properties of video games that satisfy these psychological needs and select and apply them appropriately to develop a teaching game/app. If the project is selected as a dissertation then there will be no development of software, the goal might be a framework document and an evaluation of selected existing educational games against this framework. More than one project is available.	

Project title	Statistical mapping (Epidemiology Studies) of Disease outbreak in Swansea and South Wales.
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / SE / WD
For example develop a GIS database to model incidences of measles or and other outbreak of infectious disease e.g. swine flu in the Swansea or a case study area. Use GIS techniques to analyse this data. Examine correlations between datasets, deprivation indexes, and other socioeconomic factors, e.g. MMR vaccination uptake. This is known as epidemiology mapping	

Project title	Accident Monitoring Using GIS
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	/ CG / CIS / SE / WD
Build a GIS to map accident occurrences in a given location which could be used to analyse and plan road networks.	

Project title	Deprivation Studies using GIS
Project type (Delete as appropriate)	Development / Survey / Experiment / Review
Target degree lines (Delete as appropriate)	BIT / CIS / SE / WD
Using UK census data to map the socio-economic patterns found in South Wales, or whole of the UK. This could be linked to several project idea and titles:- • Analysis of student application statistics for SMU registry and marketing departments. • Looking at the incidences of house fires and deprivation and interactive guide for the Fire service. • Crime pattern analysis – is there a socio economic link could we build a database and a GIS to demonstrate this?	

Project title	Compare Statistical analysis with and without A GIS reference
Project type (Delete as appropriate)	Development / Survey / Experiment / Review
Target degree lines (Delete as appropriate)	BIT / CIS
A GIS will allow for statistical analysis of data. Is this an advantage? Could we produce the same results using conventional database management systems?	

Project title	3-D visualisation of Spatial data
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	CG / CIS / SE / WD
Using GIS and or a spatial database with visualisation techniques to examine coastal / terrain data. This, for example, could be used to look at issues in environmental conservation.	

Project title	Web applications of GIS
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	CIS / WD
Building and interactive web based GIS for a given application. How do we display 3-D geographical data on a website? Looking at spatial datasets and examining methods for web visualisation.	

Project title	Location based services LBS
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	CG / CIS / SE / WD
What are location based services and how will they affect our lives? This could be linked to several project ideas:- • Estate management. How do large organisations such as Universities or hospital sites track maintenance requirements? • Could the use of GPS and location technology help with this MIS system? • Use of GPS and Smart Phones to build a GIS for student union services.	

Project title	Geographical Timetable
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	CIS / SE / WD
Could link to LBS or estate management link to room building location. Could be used by a university or school. Smart phone ap etc.	

Project title	A comparison of End User Development Environments
Project type (Delete as appropriate)	Development / Survey / Experiment / Review
Target degree lines (Delete as appropriate)	BIT / CIS
Software such as Microsoft office allows for end user development (via VBA) research this development environment and compare and contrast the facilities offered by other software vendors for example Lotus smart suite.	

Project title	End User Computing in SMEs
Project type (Delete as appropriate)	Development / Survey / Experiment / Review
Target degree lines (Delete as appropriate)	BIT / CIS
Small to medium size organisations have to adapt the way in which they operate to survive in today global market. How do these organisations implement IT strategies and do they make effective use of End User Development software (e.g. building applications using VBA)?	

Project title	Users / Managers perception of End User Computing / Development
Project type (Delete as appropriate)	Development / Survey / Experiment / Review
Target degree lines (Delete as appropriate)	BIT / CIS
Research into the understanding of EUD/C, from a user's perspective and or from the management's viewpoint. How do organisations control EUD? Are we seeing a standard approach within organisation large or small to data analysis for example? What about quality issues with reference to the design of the end products being used?	

Project title	The impact of touch screen technology
Project type (Delete as appropriate)	Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CG / CIS / SE / WD

Project title	Alternative methods for data input and user interaction
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CG / CIS / SE / WD
Alternative methods for data input and user interaction (using touch input, Wii remotes, Microsoft Kinect, VR gloves etc)	

Project title	An investigation into DAM
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / SE / WD
An investigation into DAM (Digital asset management) (dissertation)	

Project title	Construction of a DAM
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	CIS / SE / WD
Construction of a DAM (digital asset management) system (software development)	

Project title	Cloud computing: The pros and cons
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / SE / WD

Project title	Strategies for maximising PC performance
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CG / CIS / SE /
Strategies for maximising performance or price/performance when designing a PC/Workstation out of commercially available components. (effect of overclocking, bus speeds, RAM timing, CPU efficiencies, RAID configurations etc)	

Project title	Changes in domestic computing
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT
A study into how domestic computing is shifting from the desktop PC into items such as the television and phones/tablets	

Project title	Changes in portable computing
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CG / CIS / SE / WD
Portable computing: A study into future trends and implications.	

Project title	Copyright violation detection tools
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	BIT / CG / CIS / SE / WD
Net based Copyright violations and tools for detection (e.g. TinEye for web image searching) A study of, or construction of tools for detection.	

Project title	AI Music
Project type (Delete as appropriate)	Development / Survey / Experiment
Target degree lines (Delete as appropriate)	SE
The use of AI algorithms for the production of computer generated music	

Electronics Project Titles

Robotic arms / Remote buggies

Micro-generation and/or monitoring of power (turbine, solar etc)

Solar power - tracking the sun with a heliostat

GPS tracking device (e.g. for lost pets, dementia sufferers, vehicle tracking)

General Purpose or specialist data/temperature logger (Freezer lorries, horticultural aspects, general scientific data gathering, weather data etc)

Car park controller

Intelligent Traffic light systems

Home security – Intelligent alarms, remote webcams etc

Fridge alert (e.g. text message when the temp gets too hot)

Remote control/telemetry weather station

Data telemetry via gsm/internet (collecting gas/electric/water meter data)

Ultrasonic devices for distance measurements (car reversing sensors, water level indicators, digital tape measures etc.)

Galvo control to deflect mirrors in laser scanning applications.

Using a/interfacing to, a PLC in an industrial control application/simulation

Designing, Implementing and testing a PID control loop system to control an industrial control application/simulation

Medical monitoring devices (heartbeat, temperature, pedometer etc.)

Digital Voice recorder using a microcontroller

Analogue/Digital effects for music processing (guitar effects pedal, digital delay/reverb, chorus etc.)

Custom music synthesis devices – (drum machines, bass rhythm sequencers, complete synthesisers)

Music performance interface devices – (laser harp, Theremin types, wearable input devices using accelerometers etc.)

Benchmarking / measurement device design for imaging devices. E.g.:

- A device that will be able to measure the shutter/EVF lag time in modern cameras.
- A device to allow measurement of shutter shock/mirror slap in DSLRs

Programmable autopan device for controlling and triggering cameras for timelapse photography/video (think BBC nature programs when time is sped up)

Dr Gary Jones

Areas of interest include:

- Digital electronics
- Microcontroller-based design and implementation
- Instrumentation
- Sensors and biomedical devices
- Communications
- Image processing
- Remote vehicles
- Robotics
- Analogue electronics and power electronics
- Energy management, energy generation
- Environmental monitoring
- Electronics design methods and techniques

Project title	Development of a resource aimed at users with a given disability
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT / CIS / WD
A survey would involve an evaluation framework for existing resources and would employ your choice of interface evaluation strategies such as observation, interview... A development project would include the design and development of a suitable software resource, for example an E-Commerce or E-Government site.	

Project title	Usability issues in e-government and e-voting.
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT / CIS / WD
A survey could concentrate on voting behaviour or a structured review of a chosen range of e-government resources. A development project would include prototype development and evaluation in a suitable development environment.	

Project title	The design and evaluation of a prototype for a public use application.
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT / CIS / WD
Public use applications are a challenge for developers and users. A development project would involve the design and evaluation of a suitable public use application such as one aimed at public transport users. Alternatively a survey based project could involve a user experience study of a public use application.	

Project title	Usability evaluation of an existing software application
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT / CIS/ SE / WD
This is a fairly generic usability project idea aimed at students with experience of an existing system which could be based on work or other experience. A development project would involve the building of a prototype interface employing usability principles. A survey would mean the application of usability techniques and recommendations for improvement.	

Project title	Prototype home energy use display
Project type (Delete as appropriate)	Development / Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / CNETS / SE / WD
Ubiquitous interfaces are those embedded into objects in our environment. It would be possible to develop a mockup in Visual Studio or make use of electronics resources for development of a prototype. This could be conducted as a development project or an experiment involving comparison of alternative implementations.	

Project title	Prototype mobile interface for a given application
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT /CIS /WD
With a focus on usability, this topic means the selection of a suitable task for a new mobile interface prototype. A survey would mean conducting analysis and developing and evaluating a paper prototype.	

Project title	A generic open source administration solution for administering a small charity
Project type (Delete as appropriate)	Survey / Development / Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / SE / WD
Smaller charities are facing a challenge in the large volume of administration needed to keep track of service users and apply for funding. Many are run on a shoestring and cannot afford commercial software or services. As a development project this would mean requirements analysis and the development of an open source admin system. It would be realistic to allow time for the implementation and evaluation of the system by a local charity. A survey could include the development and evaluation of a simple open source database solution. An experiment would need the construction of two or more alternative solutions and a comparison.	

Project title	Development of a Carbon Reduction Strategy for IT project managers.
Project type (Delete as appropriate)	Survey
Target degree lines (Delete as appropriate)	BIT
IT project managers need to comply with an increasing range of legislation and regulation in terms of carbon reduction (such as the Carbon Reduction Commitment). The student will need to research requirements and advice from academia and industry and produce and evaluate a strategy for implementation.	

Project title	Smart city technology
Project type (Delete as appropriate)	Survey / Development
Target degree lines (Delete as appropriate)	BIT / CIS / WD
In smart cities, investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable development and a high quality of life, through participation and engagement. A survey based project in this area would mean the analysis of demand and of existing smart city application and recommendations for the employment of smart city technology, for example based in Swansea. A development project would mean the construction of a smart city prototype on a suitable platform (perhaps mobile), for example around smart transport.	

Project title	The potential of 3D printing technology
Project type (Delete as appropriate)	Survey
Target degree lines (Delete as appropriate)	BIT
3D printing has the potential to transform the devices we use and our whole interaction with technology. A survey or research project could evaluate the potential of this technology and make recommendations for its adoption.	

Dr Steve Mosey

Project title	Smart AC circuit breaker
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE / CIS / CNets / WD
Network connected device to monitor AC power usage and provide circuit protection.	

Project title	Automatic guitar tuner
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE / CIS / CNets / WD
Device to turn machineheads on guitar in relation to pitch played on string. Ideally should also work for lute, gittern, and various sizes of ukulele.	

Dr Kapilan Radhakrishnan

Project title	Heating and Temperature Control using Wireless Sensors
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	Networks
Description: The aim of this project is to use wireless sensors to control heating and temperature of a room/building to save energy and cost.	

Project title	Internet of Things or Internet of Everything based project
Project type (Delete as appropriate)	Development/Experiment
Target degree lines (Delete as appropriate)	Networks
Description: IoT/loE is the latest technology that connects the unconnected; devices, vehicles, buildings, sensors, electronic devices, hardware and software. The technology allow us to achieve anything possible nowadays. There are number of projects available in this area and if you have an interesting feel free to discuss it with me. Some project may need Arduino and/or Raspberry Pi kits which we have to complete the project.	

Project title	Compare IPV4 and IPV6 Networks
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	Networks
Description: The main aim of this project is to compare the performances of IPV4 and IPV6 Networks in terms of throughput, delay, packet loss, jitter, etc.	

Project title	Building a Secure Home Network
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	Networks
Description: Most part of UK has broadband coverage and millions of home users are connected to Internet via ISPs. How secure are today's home network? The main aim of this project is to analyse the existing security measures on Home network and recommend steps or new security measures to home broadband users.	

Project title	Implementing a converged Network solution to SMEs
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	Networks
Description: The aim of this project is to design and implement a converged (data, voice and video) network solution to a SME.	

Professor John Rees

Project title	Develop a Social Media Web App for Home Living Support
Project type (Delete as appropriate)	Development/ Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: Develop a web app using existing social media facilities to provide a communication facility for home living support (assistive technology). This will necessitate taking account of cultural and social factors, and particularly limitations and characteristics in the interfaces in terms of usability issues. Create a suitable questionnaire for use with social services students and staff to highlight what facilities can be created and to gauge acceptability to the professional side (the client side is not readily accessible because of the time needed for ethical approval).	

Project title	A Web App or Native OS App for Medication Reminders
Project type (Delete as appropriate)	Development/ Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: Develop an app, using HTML5 and CSS, iOS or Android, integrated with calendar facilities, to implement automated reminders for taking medication. This is targeted at people likely to be prone to forgetting medication schedules (specific illnesses are a good example). The app could include automated reordering (via pharmacists and GP practice), automated recall (often medicines require regular tests for side effects, e.g. blood pressure tests with the contraceptive pill), and limited advice on side effects and common problems. Investigation of the best options for client and server side split, back end implementation and reliable confirmation of messaging are an important element of the work.	

Project title	A Web App for Personal Security Support during Home Visits
Project type (Delete as appropriate)	Development/ Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: Develop a web app using HTML5 and CSS, integrated with a timing mechanism and notification features, to confirm safe arrival and departure for social services staff visiting potentially hazardous clients. This is targeted at people working with violent offenders and unstable mental illnesses. The app could include automated notification of arrival, set appointment time with “nudge” extension, automated recall on exceeding visit period, emergency services reporting on alarm triggering or specific non-compliances with operating procedures. The work will include client side coding (smartphone or tablet as the target device) and server side development.	

Project title	Web Analytics for the Analysis and Improvement of a Facebook Site
Project type (Delete as appropriate)	Development/ Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: The School’s Facebook page has built-in analytics capability from Facebook’s Insights tool. The project will be to investigate the available options for Facebook analytics, select a suitable toolset and implement a full set of analytics as a site A/site B test to run in comparison with the existing set up. The work will then require implementation either on the School’s Facebook page or the creation of an alternative presence using the chosen analytics toolset	

Project title	Web Analytics for the Analysis and Improvement of a Website
Project type (Delete as appropriate)	Development/ Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: The School’s forthcoming research pages will require a full set of analytics to be built in (using Google Analytics or another suitable toolset). Having analysed the client need, the student will implement a suitable set of compound analytics to assess the performance of the web presence, suggesting as part of the final report any particular improvements or changes that would enhance visitor numbers, community and progression to application.	

Project title	Beam steering WiFi in a Small Antenna Array
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
This project will involve the design and development of a WiFi transmitter using a small phased array to steer the beam. The design will concentrate on the development of the filters to provide a controlled directional beam steer using either phase difference or time delay, and the design of the MiMo or phased array antenna. Simulation of the system will be used to verify the design. Performance, particularly directional control and beam width will be investigated. http://www.theruckusroom.net/2010/12/beamforming-in-all-its-glory.html	

Project title	Guitar/Bass Effects with Lighting Control
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
This project will involve the design and development of a guitar or base guitar effects pedal with an integrated communication facility using Bluetooth LE or WiFi to drive lighting effects. The RF part will be bought in as transceiver modules. The design will concentrate on the effects side (e.g. delay, echo, phasing) using a microcontroller-based digital design, and on the determination of what initiates lighting changes (meter, rhythm, beat, "mood", etc.) and the triggering circuitry to drive lighting effects from the received signal. Simulation of the system will be used to verify the design before implementation.	

Project title	DDANCER – Dynamic Drone Anchoring and Equidistant Routing
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
Using two camera equipped drones, the project will seek to evaluate the potential for mutual control over Bluetooth or WiFi links. The intention is to first stabilise both vehicles using the other as the reference point and control source, then investigate the viability of synchronised flight patterns using one as an externally (human) controlled master and the other as a slaved drone. Background research will include control strategy and investigation of swarm capability.	

Project title	SYNAPSE: Synchronised Applications for Shared Entertainment
Project type (Delete as appropriate)	<i>Development</i>
Target degree lines (Delete as appropriate)	CSE/EE
The project will investigate the development of a distributed application for shared determination of music to be played in entertainment spaces. Using a voting system through mobile telephones, the app will evaluate preferences, both directly in terms of song titles and indirectly in terms of genre/mood heuristics, to determine automatically what to play via the music server. The intention is to develop the app for Android. Written in Eclipse/JAVA or C/C++/C# in a suitable environment, the app will link each phone via the web to the back-end business logic and playlist using PHP and MySQL. Development as a Web App using HTML5/CSS3/JavaScript with PHP and MySQL is an alternative strategy for the mobile handset.	

Project title	Internet of Things Measurement, Weighing and Reordering
Project type (Delete as appropriate)	<i>Development/Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
The project will initially require the development of a microcontroller-based central communications box <u>either</u> relaying data from Bluetooth or WiFi capable sensors over the Internet to a separate server <u>or</u> acting as a local server for Internet transmission. A good candidate may then proceed to implementing various sensor packages (weight, fluid flow, temperature) integrated with the communications box over the wireless link. The investigation will review methods for automated reordering, and how security and other considerations might affect the system and its design.	

Professor Ian Wells

Project title	Novel Digital Filter Design for use in Modems
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
The aim will be to design, simulate (Matlab) and implement (VHDL and Xilinx FPGAs) a novel and power efficient multiplier for use in a modem based communication systems. A simple modulation technique (e.g. BPSK) would be used as an initial proof of concept. This project would only be suitable for students with an electronics/communication background. (this is a well-developed project with a lot of previous work to refer to)	

Project title	Communication System Simulation and Characterisation
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
Modelling the behaviour and characterisation of OFDM with the aim of comparing and characterising its performance in Gaussian, Rayleigh and Rician channels. Different channel coding methods will also be investigated to compare their performance.	

Project title	Hardware and Software Implementation of a PSK Digital Modem
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
This project will involve the design and development of a simple wireless digital modem using PSK. The RF part will be bought in as a module and the design will concentrate on the development of the modulator, demodulator, clock recovery, carrier recovery circuits etc. Simulation of the system will be used to verify the design before implementation. Performance of the modem in different circumstances will be investigated.	

Project title	A Sea depth measurement system
Project type (Delete as appropriate)	<i>Experiment</i>
Target degree lines (Delete as appropriate)	CSE/EE
This project will develop electronic hardware that is able to use sound pulses to measure the depth of the sea. The project will involve the use of sensors and the design of suitable hardware able to generate and capture the sound pulses that are generated. Factors that will need to be considered include tides, wave motion and multiple sound reflections.	

Project title	Pattern block maker
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	SE / CGD
Cosplay has become a popular pastime in Geek culture, but costumes themselves can be very difficult to make because patterns are not available for many popular characters. A tool is needed that allows users to enter body measurements onto a simplified human form, draw the lines of the clothing they want, then automatically generates the patterns for the clothing as flat pieces ready for printing.	

Project title	A game-based usability demonstrator
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	BIT / CGD / CIS / WD
There is a massive variation in visibility when objects of one colour are placed on top of a different background colour. This project aims to produce game-based demonstrator of this phenomenon that will also allow users with colour vision deficiencies to identify colour combinations that are particularly clear to them.	

Project title	Data visualisation using an interactive holographic display
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CGD / SE
"Pepper's Ghost" is a Victorian visual trick used to make images 'appear' in mid-air. This has recently been demonstrated using computer graphics to generate moving holographic images using Unity or a similar tool. The aim of this project is to create a gesture-controlled (LEAP Motion) programme for displaying and manipulating multidimensional data.	

Project title	ConNet – A Physical Web tool for conferences
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CNets / CIS / SE / WD
Google's Physical Web is based on the use of Bluetooth beacons to provide highly localised information to users via their mobile devices. A system is required that can allow conference organisers to automatically show a conference's schedule, show what items are in each room, and possibly allow users to find each other by triangulation of beacon signals.	

Project title	A LEAP Motion controlled game
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CGD / SE
The LEAP Motion is a device for allowing gesture-based control of a computer for use with games or the main Windows interface. The aim of this project is to produce a demo game in Unity that will showcase the capabilities of the device. https://www.leapmotion.com/	

Project title	Usability comparison of a set of websites
Project type (Delete as appropriate)	Experiment
Target degree lines (Delete as appropriate)	BIT / CIS / WD
Usability is generally explored as a method of ensuring that an individual website is as easy to use as possible. It is, however, also possible to use usability metrics to compare multiple websites within a business sector, both to identify those elements which are viewed as essential by the website owners and to investigate whether these websites actually meet the needs of sector stakeholders. This project will involve using a set of well-defined metrics to design and carry out a series of usability tests on a set of websites in a sector selected by the investigator.	

Project title	Mixed Reality with ZapBox
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CGD / SE
ZapBox is an inexpensive mixed reality development and display tool. The aim of this project is to produce a demo application that will showcase the capabilities of the device. http://www.zappar.com/zapbox/	

Project title	Semantic net-based chatbot
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE
A semantic net is a network of nodes that encode meaning. These can be used to predict sentences that can be used as part of a conversation with a human user. This project aims to create a semantic network that can hold a conversation with a user on a single pre-defined topic	

Project title	Investigation implementation and evaluation of up-to-date Social Media strategies for SMEs.
Project type (Delete as appropriate)	Survey / Experiment
Target degree lines (Delete as appropriate)	DIS, BIS
Your research would investigate test and evaluate the various social media platforms and promotion strategies available for Organisations today. An up-to-date best practice Guide for Businesses will be produced based on the evaluation.	

Project title	Investigation and development of a final year Project Library Management System.
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC, DIS, BIS, WD, SE.
Your research would investigate and develop a Library Management System for final year projects enabling students to e.g. search find bookmark read and review past final year project dissertations. Note: specifically for Computing students.	

Project title	Investigation and development of a Promotional Casual Game for a Case-study Organisation (AC).
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC, DIS, BIS, WD, GD, SE.
Your research would investigate and develop a promotional Casual Game for a Case-study Organisation.	

Project title	Investigate and develop a Voice Activated (VA) Virtual Assistant solution to enhance user well-being.
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC, DIS, BIS, WD

Your research would investigate and develop a Voice Activated (VA) Virtual Assistant skill solution using up-to-date VA technologies (such as Amazon's Alexa / Google Home / Siri) to enhance user well-being e.g. in an area such as learning or/ health / student support / learning disability / mental health / assisted living.

Project title	Investigate and develop an Augmented Reality (AR) solution to enhance user well-being.
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC, DIS, BIS, WD, SE.
Your research would investigate and develop an Augmented Reality solution to enhance user well-being e.g. in an area such as learning or/ health / student support / learning disability / mental health / assisted living. * * Supervisor would likely be a member of academic staff with related development experience.	

Project title	Investigate and develop a downhill carting Augmented Reality (AR) Game for a case study company.
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	AC, DIS, BIS, WD, SE, GD.
Investigate and develop a downhill carting AG Augmented Reality Game for a case study company.* * Supervisor would likely be a member of academic staff with related development experience.	

Projects from Industry

Leigh Thomas, UWTSD Health and Safety Manager

Project title	Data Management
Project type (Delete as appropriate)	Development/Experiment/Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: The university has a very large number of assets that require statutory tests – e.g. fire alarms, emergency lighting, PAT testing etc... We need to keep track of all of the certification that we get surrounding the tests. A database is needed to hold the compliance information: date the test was carried out, date of next test and details of what company carried out the test and if there are further actions required following the test (remedial actions). The system needs to have the functionality to run reports and to remind key personnel (via email) when new testing is needed with details. A user-friendly front end to accompany the system would also be needed.	

Project title	Online Enquiry Management
Project type (Delete as appropriate)	Development/Experiment/Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: Online form (on the intranet) needed for staff to be able to fill in with details of their enquiry. The details need to populate an online database which can be accessed by authorised personnel to update. There needs to be a system for keeping the history of action relating to an enquiry – i.e. who did what and when relating to each enquiry. Once an enquiry is dealt with it can be closed out. Monthly reports will be needed on how many enquiries are still ‘open’ which ones have been ‘closed’ and how long it took to close actions out. A user-friendly front end to accompany the system would also be needed.	

NWIS – See Professor John Rees

Project title	NHS Wales Informatics Service: Develop and utilise a workforce modelling tool to support long-term strategic workforce planning
Project type (Delete as appropriate)	Development/Review:
Target degree lines (Delete as appropriate)	CGD / SE / BIT / CIS / CNetS / WD
Description: Aim is to develop a workforce modelling tool to analyse one or more possible futures to choose the best option to align the future workforce with our business objectives. In this project, the purpose of the modelling is to forecast demand and supply for a range of plausible futures and to determine the roles needed to achieve a sustainable balance of demand and supply.	

Dr Tom McKinnell (Durham GP), supervisor Dr Nik Whitehead

Project title	Smart Pillbox
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD
Medication for Parkinson's disease needs to be taken up to 10 times a day by patients with higher chances of dementia and changing medication regimes. A programmable modular self-opening and alarm ringing box that can be programmed from a tablet/mobile phone would be very useful. This would include mobile/web and a small amount of Arduino programming.	

Minor Injuries Unit, Newport, supervisor Dr Nik Whitehead

Project title	Web-based A&E guidelines for MIU
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / WD
Local Minor Injuries Units include, within their documentation for staff, a comprehensive list of other things to check for when patients attend the MIU with particular symptoms. This aids the staff in making sure that potentially dangerous complications are not missed. A need has arisen for a computerised version of these documents, organised as a website that can be accessed easily through a mobile device. Usability, information architecture and security are of prime importance for this website.	

Industrial Project, supervisor Dr Nik Whitehead

Project title	Smart Pillbox
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CIS / SE / WD

Medication for Parkinson's disease needs to be taken up to 10 times a day by patients with higher chances of dementia and changing medication regimes. A programmable modular self-opening and alarm ringing box that can be programmed from a tablet/mobile phone would be very useful. This would include mobile/web and a small amount of Arduino programming.

BrdSports – See James Williams

Project title	Augmented Reality Game
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	CGD / SE
We are looking to develop an exciting new augmented reality game that will link the players physical world with the digital game. Augmented items will need to be placed at specific locations for collection on a board or kart (powered by gravity or an electric motor). The idea would be to create a game with similarities to Mario Kart in game play coupled with obvious real world physical activity health benefits. Taking what has been done with the Wiifit and Pokemon Go to the next level.	

BrdSports – See James Williams

Project title	Web Development
Project type (Delete as appropriate)	Development
Target degree lines (Delete as appropriate)	WD
Extreme sports company looking to track buyer info and sell equipment via the internet. New Online shop and with a personalized account and log in capability. Needs to be able to store account user specific information including, sales history user details and personal information. Re-develop website linking with social media platforms.	