Project Code:	A01
Proposer Name:	David Cutting
Project Title:	Appointment Manager
Abstract/Problem Description: (~200 words)	We often want to be able to schedule a number of appointments, for example to meet interview candidates or give students feedback. There are a number of tools to accomplish this but the freely available ones aren't very flexible and the others are commercial offerings.

Revolving around appointments this project covers a wide number of potential use cases including individuals being offered a slot to meet, groups being asked to find a suitable time for them all, validation of appointments being required or not (can anyone just reserve a slot), cancellations, "best fit" appointment management, integration with third-party calendars etc.

The project will be to initially gather requirements from stakeholders within EEECS and perform a competitor analysis before deciding on an implementation plan and requirement priorities.

Development should be done in an agile and iterative manner using some concept of Software Product Lines (highly de-coupled components) to deliver everything but the core functionality.

This project addresses a real current need and the intention will be to release the software to the community under an open source licence (GNU General Public Licence v3) |
Primary Area: (e.g. Web Application)	Web Application
Secondary Area: (e.g. AI)	Scheduling
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Web
Primary Technology: (e.g. .NET)	HTML + JS for Frontend and suitable backend (of choice – e.g. PHP or Python or .net)
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Individual**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A02
Proposer Name:	Simplified Silicon Limited – David Cutting
Project Title:	Dynamic DNS System (dnsmash)
Abstract/Problem Description: (~200 words)	The majority of Internet-connected devices are assigned a dynamic IP address i.e. their IP address can change periodically. For connecting out this is fine but when you want to run services inside your network exposed to the Internet (for example a web server on your Pi) this becomes a problem as you need to re-map a hostname www.mypi.example.com to a new IP on a regular basis. To overcome this there are a number of Dynamic DNS providers who offer a number of different services at different costs. DNSmash will be Simplified Silicon's offering in the Dynamic DNS space, primarily used for their own customer needs but also probably offered externally on a tiered basis. Some work has already been done on a API spec and front/back ends but this is limited and can be thrown away as needed. Simplified Silicon have an internal structure in place to support customer Dynamic DNS needs for the moment but the hope is that DNSmash will replace these. There is potential for this to be an individual or group project, though a group implementation would need to have clearly defined roles (for example one concentrating on the DNS technology and client, one on the UI) and be carefully scoped. The project: build a fully-featured Dynamic DNS engine specifically including the ability to update hostnames in a timely fashion. Simplified Silicon will provide all the infrastructure required including virtual servers with BIND9.
Primary Area: (e.g. Web Application)	DNS and Web
Secondary Area: (e.g. AI)	Dynamic DNS, Network Infrastructure
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Linux and Web
Primary Technology: (e.g. .NET)	DNS (BIND9) and PHP
Secondary Technology: (e.g. C#)	Web and back-end
Is the project an Individual or Team based project? (Max 4 in team)	**Individual or Team (2/3/4 members on agreement)**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**YES**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A03
Proposer Name:	David Cutting
Project Title:	FreeNATS App
Abstract/Problem Description: (~200 words)	FreeNATS (the Free Network Automatic Testing System) is an open-source network monitoring, alerting, and reporting system (http://www.purplepixie.org/freenats) written primarily in PHP. Once set up the FreeNATS server will connect to remote hosts and perform tests (ping, web page request, etc) and record the result including the time. Data can also be sent and fetched from remote nodes through the use of "nodeside agents" to collect memory usage, disk usage, and other statistics. The FreeNATS system examines the data from the tests and, if threasholds are breached, or a test fails in some way, raises an alert. Alerts can be configured to act in certain ways the most common being to send a notification email to the admin staff, but they can also execute API calls or commands on the server. There is a very old poorly functional "mobile friendly" version of the interface but this is rarely used. The challenge admins face is upon receipt of an email altering them they have to logon to the interface (either the main not mobile friendly or the semi-functional mobile one) to see the results, often from a mobile device. This project is to write a mobile app (ideally an HTML app that is multi-platform) which will interface with the FreeNATS XML API and provide easy access to network status information and data. Use of features such as push notifications could also be investigated. The app would be developed as open source under the GNU General Public Licence v3 and all source code made available under this licence to the community. Full credit will remain with the author. Though initially envisioned as an individual project scope would be there for two people to work on the project collaboratively with clearly defined areas of responsibility for example (1) overall app package and UI, (2) data exchange and representation.
Primary Area: (e.g. Web Application)	Mobile app (HTML app)
Secondary Area: (e.g. AI)	Network Monitoring, Systems Availability
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Mobile Platforms
Primary Technology: (e.g. .NET)	HTML with HTML app packages such as cordova
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Individual / potential for 2 members**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A04
Proposer Name:	David Cutting
Project Title:	IoT Hub
Abstract/Problem Description: (~200 words)	There has been a widespread increase in the number of "smart" IoT devices such that many homes now include smart lights, smart plugs, smart heating, etc. Most of these provide their own apps or interfaces and some coordinating systems (such as Google Home or Amazon Alexa) are able to tie them together. However there is a need for a unified platform/interface which can be used on a simple web browser to control all the smart devices within a home from a single point. Ideally this would be a very flexible piece of software capable of showing different interfaces (from a very simple "lightswitch" to more complex) and able to interface with a wide variety of IoT platforms and devices. Support for this project in terms of device access would be provided through the EEECS IoT lab. The project would require good software engineering to build a highly de-coupled system with separate user and device interface modules allowing maximum flexibility. Deployment would also be flexible with the option for on-premises deployment for example on a RPi or a docker container, and the possibility of cloud hosting and connectivity would also need investigation. Security and authorisation would be key aspects of this and a granular multi-level model would be needed. This project is suitable as a group project with clearly defined roles, or alternatively individuals could attempt a subset of all the functionality areas.
Primary Area: (e.g. Web Application)	Web Application
Secondary Area: (e.g. AI)	IoT
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Web
Primary Technology: (e.g. .NET)	HTML and JS with a suitable backend (PHP or Python)
Secondary Technology: (e.g. C#)	IoT
Is the project an Individual or Team based project? (Max 4 in team)	**Individual or Team (up to 4 members)**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A05
Proposer Name:	David Cutting
Project Title:	SQL Feedback
Abstract/Problem Description: (~200 words)	When students learn SQL they are commonly given some inputs such as a schema or data to create/update and they create SQL statements to fulfil this. Although their queries may succeed commonly a human then needs to check their work to ensure the schema does meet requirements for example. A long-winded and error-prone activity especially on complex deliverables. This project is to create a web system which allows for (a) the definition of the requirements [what is the actual output expected – perhaps in the form of an example schema or update] along with any pre-existing base conditions and (b) the uploading and execution of SQL by students to gather real-time feedback. The process should include a transparent series of tests checking the submission and highlighting issues/errors found. The precise format of this (as a feedback aid, a teaching aid, or even for summative assessment) can be decided as can the precise scope in terms of what it will cover in discussions with the supervisor.
Primary Area: (e.g. Web Application)	Web Application
Secondary Area: (e.g. AI)	Databases
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Web
Primary Technology: (e.g. .NET)	HTML and JS for the frontend, suitable technology for the back end such as PHP, MySQL database engine
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Individual**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A06
Proposer Name:	David Cutting
Project Title:	Travel Tracker App
Abstract/Problem Description: (~200 words)	The Tyndall Centre for Climate Change Research is a world-renowned multidisciplinary centre of excellence around climate change research. As part of their strategic goals they wish to reduce their own carbon footprint as it turns out climate scientists can travel an awful lot. To this end a prototype web-based travel tracker was developed and been used internally within Tyndall for the past several years.

Adoption of this (recording of trips) has been mixed and one main barrier has been the lack of an easy interface to log trips (users have to visit a website, log in, and enter data). Therefore an easy to use mobile app to facilitate easy data entry (and with scope for viewing of previous trips etc) would be an ideal solution. Recently more institutions outside of Tyndall have started to use the tracker to log their own trips.

The app would ideally be multi-platform through use of Hybrid (HTML app) technologies such as Cordova so one app could run on multiple platforms, though technologies such as Xamarin could be considered or even a platform-specific app.

Ultimately if this project is successful then the app would be released and made available by the Tyndall centre with full credit given to the author and so the expectation is the app would be released under the GNU General Public Licence v3 as open source. |
Primary Area: (e.g. Web Application)	Mobile App (HTML)
Secondary Area: (e.g. AI)	Climate Change, Data Management
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Android and iOS (with possible Windows and Blackberry if needed)
Primary Technology: (e.g. .NET)	HTML app (cordova etc) though flexibility if needed
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Individual**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	**A07**
Proposer Name:	Dr Darryl Stewart
Project Title:	Android Video Processing App
Abstract/Problem Description: (~200 words)	Android app to capture video from forward facing camera and perform image processing such as facial landmark detection, region cropping, compression, encryption etc. before uploading to a Cloud server for further processing. Existing code is available for various parts of this project and there is opportunity for integration with an existing Cloud-based biometric service.
Primary Area: (e.g. Web Application)	Android
Secondary Area: (e.g. AI)	Image processing/biometrics
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Andoid
Primary Technology: (e.g. .NET)	Java
Secondary Technology: (e.g. C#)	OpenCV/Dlib
Is the project an Individual or Team based project? (Max 4 in team)	**Individual**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**YES**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A08
Proposer Name:	Ian O'Neill
Project Title:	Event App and Website
Abstract/Problem Description: (~200 words)	Create an Android/Java app (and an accompanying administrator's/organiser's website in Windows) for a real sporting, musical or cultural event of your choice. For each individual fixture/performance etc., the app should provide advance information, live coverage, and results/reviews/recordings, in a variety of media. The system should pro-actively make information available to the attendee, based on the profile that he/she provides on registration. There should be an option to make announcements, or to send alerts for forthcoming fixtures/performances, by text-message or e-mail. The system should make use of Google maps to present relevant route and location information. The system should provide information to attendees that extends beyond the event itself – offering information on travel, accommodation, tourist attractions, restaurants and related events. Developers should aim to identify appropriate 'value-added features' that enhance the visitor's enjoyment of the event – for example: competitions, spot prizes, schedule/itinerary managers (some of these may make use of the location/range/journey time information available through Google maps). The system should provide appropriate facilities for a system administrator, enabling him/her to configure the system for a particular event and to moderate system content. Likewise the system should provide facilities for those organising or reporting on the event so that they can make information available to attendees. Team members should agree the detailed scope of the project with the project supervisor. They should each identify a rich set of system features which they will individually implement and which will complement each other in the context of the Event App and Website.
Primary Area: (e.g. Web Application)	Mobile App and Website
Secondary Area: (e.g. AI)	Event Management
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Android, Windows
Primary Technology: (e.g. .NET)	Platform-dependent (e.g. Java or PHP)
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	4
Will the students be required to sign a Confidentiality IP Agreement for this project?	NO
Will the students be required to sign a NDA for this project?	NO

Project Code:	A09
Proposer Name:	Ian O'Neill
Project Title:	Automated Medication Adherence Companion
Abstract/Problem Description: (~200 words)	Often medical regimens, especially for chronic illness, require patients to take a daunting combination of medications. These may have to be administered once a day en masse, or periodically over the course of the day. For some older patients, particularly those who are living alone and becoming forgetful, automated systems can sometimes provide valuable reminders, encouragement and advice, so making the medical regimen less intimidating. Such systems can also provide new opportunities for healthcare professionals to manage the regimen and intervene if problems arise. The aim of this project will be to develop a 'medication companion' to assist both patient and carer. As seen by the patient, the companion will take the form of an engaging avatar that can express satisfaction or concern. Techniques used in affective computing with relational agents are likely to play a significant part in development of this aspect of the system. The system 'personality' that is embodied by the avatar will react to achievements and setbacks, sending clear (non-verbal or para-linguistic) messages to the patient when it comments on what has happened or demonstrates what should happen. From the perspective of the healthcare professional, the system will provide: an interface that enables patients to be registered, their regimens configured and simple regimen-related rules-of-thumb entered; as well as an easy-to-understand 'dashboard' that alerts the healthcare professional to significant developments in their patients' adherence plan, and provides a means of initiating an appropriate response when human intervention is required.
Primary Area: (e.g. Web Application)	Mobile App and Website
Secondary Area: (e.g. AI)	Healthcare, Assisted Living
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Android (patient subsystem); Windows and Android (healthcare professional subsystems – desktop [main interface] and mobile).
Primary Technology: (e.g. .NET)	Platform-dependent (e.g. PHP or Java)
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Team(3):** **Patient-facing avatar and general interaction; medical adherence tuition; administration and dashboard facilities for healthcare professional**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**YES**
Will the students be required to sign a NDA for this project?	**YES**

Project Code:	**A10**
Proposer Name:	Ian O'Neill
Project Title:	Wildlife App and Website
Abstract/Problem Description: (~200 words)	Create a wildlife information app, and an accompanying administrator's website, in an area of your choice – e.g. birdwatching; red squirrel conservation; cetacean spotting. The app should be oriented towards enthusiasts and families in the first instance, though providing sufficiently accurate and timely information to appeal to dedicated users also. The system should provide an opportunity for spotters to upload details of their sightings as well as their photographs. The system should enable sighting hotspots to be easily identified and to provide information to other users about how to get there. Dedicated users should be permitted to enter registration details, which might, for example, be used to alert the user to sightings of a particular species, or to sightings or facilities within a certain radius. Google maps may be used to present such information and perform associated calculations. To broaden the appeal of the app to casual or family users, it should help with itinerary planning for a day-trip or afternoon out, enabling users to identify places of interest – shops, cafés, playparks, etc. – that might be near or en route to spotting sites. Quizzes and reference material may be included in the app to enhance its educational and entertainment value. The accompanying website should provide adequate resources for configuration/moderation of content by a system administrator.
Primary Area: (e.g. Web Application)	Mobile App and Website
Secondary Area: (e.g. AI)	Leisure-time management
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	Android, Windows
Primary Technology: (e.g. .NET)	Platform-dependent (e.g. Java or PHP)
Secondary Technology: (e.g. C#)	
Is the project an Individual or Team based project? (Max 4 in team)	**Individual/Team(2)**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**

Project Code:	A11
Proposer Name:	John Bustard
Project Title:	Crowdsourcing a common sense knowledge base for Artificial General Intelligence
Abstract/Problem Description: (~200 words)	Build on an existing "Sims-like" representation of everyday life (github.com/johndavidbustard/RoughWorld). Create one or more mechanical turk (https://www.mturk.com/) applications to crowdsource data modelling typical locations, objects, poses and stories within peoples' lives. Help create the next leap forward in AI and learn about Mechanical turk a key tool for data analysis and machine learning. This project is supervised by John Bustard (https://www.linkedin.com/in/johndavidbustard/) please email j.bustard@qub.ac.uk to learn more about this project.
Primary Area: (e.g. Web Application)	Mechanical turk
Secondary Area: (e.g. AI)	AI
Primary Operating System: (e.g. Windows 10, Android, Multi-platform etc.)	HTML/Javascript
Primary Technology: (e.g. .NET)	Java
Secondary Technology: (e.g. C#)	TBD
Is the project an Individual or Team based project? (Max 4 in team)	**Individual**
Will the students be required to sign a Confidentiality IP Agreement for this project?	**NO**
Will the students be required to sign a NDA for this project?	**NO**