

KIT301: ICT Project A

Project List (2023)

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Project 1: Saving Life's at Sea Gamified Learning Experience

Project Location: Hobart ☐

Launceston ☒

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

John Courtney
Balin Puccetti
AMC Search, UTAS
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Launceston Campus

Project Description

Create an innovative Vessel Operational game/gamified learning experience to help prevent accidents and save lives at sea.

The Australian Maritime College provided training to International and Domestic Seafarers.

The Deck officer oversees safety of the vessel on the Bridge, Their primary duty to navigate and steer the vessel.

AMC would like to start this learning experience into the living room with your family as passengers onboard your vessel as Captain or Coxswain.

To do this, The Coxswain course allow Master's to command a vessel up to 12 metres.

AMC wants to take the boating experience into your home or workplace. Creating a game/gamified learning experience that allows you to start manoeuvring the vessel and practicing a variety of maritime evolutions e.g. Person Overboard and Search and Rescue.

The game would consist of different levels and challenges on both inboard and outboard engine vessels, of displacement and planning hull design.



“Take the AMC vessel experience home and start your maritime journey as a Deck Officer.”

You will have the support of the Australian Maritime College (AMC) and specialised staff and equipment in both Emergency Response and AMC Search Ltd Digital Services. In the preparation, launch and recovery of the Survival Craft there must be hand eye coordination/connectivity to the simulation and equipment.

AMC supports the Vision and Mission statement of the Australian Maritime Safety Authority (AMSA) and strives to take safety training into the future for all working at sea.

Vision: Safe and clean seas, saving lives.

Mission: Ensuring safe vessel operations, improving the competency of crews to safely abandon ship following a serious onboard emergency.

Project Technical Information

Platform – PC

Software – Unity/Blender

The game/gamification learning experience will need to run on a local server.

Project 2: Urban Logistics App

Project Location: Hobart ☐

Launceston ☒

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Bing Wei, Stock Walks International Pty Ltd
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Project Description

Background

Urban logistics becomes important in recent years. There is a demand and supply gap in city transportations. Some suppliers do not have their own trucks or drivers to deliver the goods to supermarkets or groceries. However, some other suppliers or logistic companies may have idle drivers and trucks at the moment. Such dis-match makes it a waste of resources. We, StockWalks, a Melbourne-based logistic company (with estimated turnovers of AUD 8 million per a.n.) has several idle drivers and trucks every day so that we want to share the idle trucks to those who do want drivers and trucks at the same time.

Objective

We propose a project to create a mobile App from scratch. The main function of the App is to allow users to find available idle drivers and trucks in real time, accompanied with a booking and payment system.

Main Function Requirements of the App

- Allow users to register the truck and drivers' information (capacity of truck, with/without freezer, available time) into the system
- Have a map view to show where the activated trucks are in real time
- Have a separate time-based list view to show which trucks are available at which time, so that users can book the trucks in advance (a.k.a HotDoc, similar to you want to book a GP)
- Have a payment system (a.k.a Uber) to support the booking

Project Technical Information

No specific language requirement. The app should be applied in both Android and IOS systems

Project 3: Bee Hive Management System

Project Location: Hobart ☐

Launceston ☒

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

A/Prof. Jiangang Fei, AMC, UTAS
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Project Description

The objective of the project is to digitalise the traceability of honey production for reporting and compliance. The team will focus on converting the current manual process of recording the movement of bee hives right to honey packaging into a digital system. To achieve this, the team will need to develop:

- A mobile app which can allow a bee keeper in field to record the location of the hives and their movement.
- A database with will store the data collected through the app
- A dashboard which can allow users to check the current hive locations and information
- A report generation module which can automatically generate reports for compliance and general business use.

The team will be given more details as what data need to be capture and in what environment.

Project Technical Information

- Mobile app development
- Web application development
- Database development
- This application will work with another application to be developed (RaC) as input to check compliance with the Biosecurity Code of Practice.

Project 4: Codifying Biosecurity Code of Practice

Project Location: Hobart ☐

Launceston ☒

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

A/Prof. Jiangang Fei, AMC, UTAS
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Project Description

Related policies and regulations in the Australian Honey Bee Industry can be released from different government agencies and updated at any time. This brought difficulties for bee keepers to check and follow the latest regulations which are related to their products. There is a great demand to have a knowledge management system which can facilitate the searching and checking of rules related with particular stakeholders and products in the honey industry.

This project is to develop a knowledge management system which can:

- Provides a repository for policy and regulation documents related to the honey bee industry;
- Facilitate the searching of related documents and rules based on user's query;
- Convert the code of practice, which is encoded in natural unstructured language (English), into a set of machine-consumable rules for use by different types of users, including bee keepers, biosecurity authority, industry peak bodies and other stakeholders having interest in biosecurity compliance.

This project will focus on the development of the overall system framework and an interface/application for **bee keepers**. If the students can progress well, interfaces/applications for other types of users can also be developed in the project. A copy of the Australian Honey Bee Industry Biosecurity Code of Practice will be provided to the team, but the actual code/rule may change after consulting with the industry. The interface/application may be connected to another application to be developed (as input for biosecurity compliance).

Project Technical Information

- Programming skills
- Database design and development
- Web application development

Project 5: A Platform for Smart Waste Management in UTAS

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Muhammad Bilal Amin and Saurabh Garg, School of ICT, UTAS
Catherine Elliot and Mary Gill, UTAS Sustainability
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Project Description

This project will involve development of a frontend waste management mobile app and portal which is utilised by the students at UTAS to contribute towards recyclable waste and tracking the contribution.

The platform consists of three modules; (1) Waste management knowledge resource, which guides UTAS students about waste management, sustainability programs, recycling, and circular economy. The knowledge contents are aligned with the resources provided by the UTAS sustainability team. (2) UTAS digital map, which guides its users towards the closest and most appropriate rubbish bin. (3) A primitive AI component that can recognise items and provide recommendations for its proper disposal.

There have been previous iterations of this project and generated outputs will be reused for implementation. The core focus of this iteration is delivery of the platform.

Project Technical Information

The platform is expected to have a web and smartphone front end. With Web implementing the Module 1 (described above) and smartphone (android app) for second and third modules.

The development of the project is platform independent. Development team can pick a platform of their choice to implement the Application, Web-front, and backend; However, for feasibility and compatibility with previous iterations, the selection of the platform must be discussed with the client prior to implementation.

Project 6: Workload Allocation and Reporting System

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Project Manager (ICT) on behalf of Prof. Caleb Gardner (IMAS, UTAS) and Prof. Byeong Kang (ICT, UTAS)
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Phone: 0457251203

Project Title

Workload allocation and reporting system for human resource management

Project Description

The objective of the project is to create a tool for managing and monitoring workload in IMAS that leverages the existing rule-based function for determining the workload model. The tool should generate reports and analysis tools for managers and leaders, allowing them to assess individual and group workload allocation. These reports will assist IMAS members in maintaining an appropriate workload.

The project aims to gather data on current and future workload for teaching, research, and services and create a dynamic dataset and workload model. It involves collecting data from various sources, ensuring consistent data entry, visualizing the data for managing workload and performance, and maintaining accurate workload models. The tool will generate regular reports for individual and group workload allocation, identify periods of under or overloading, check that research, teaching, and service roles are properly staffed, and assist managers in solving resourcing problems. Additionally, it will provide guidance on future workload by including potential but unconfirmed tasks.

Project Technical Information

This project has legacy code and student could redevelop to integrate to the existing system, or refactor those.

- This program is supposed to use Vue as frontend framework (could be change to other framework, need discussion first), and JAVA spring boot as backend framework

Project 7: Virtual DB and Metadata Management

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

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Project Title

Virtual database and metadata management system

Project Description

The Australian Antarctic Division (AAD) has initiated a program to improve the shareability of its research data.

Develop a data management module called VDB that virtually centralises AARD by providing comprehensive and consistent access to data via a secure abstraction layer, this layer can further participate as an API to support extended usability and services such as Analytics and Visualisation.

Develop an AI-assisted meta-data management (MDM) component as an extension to VDB, which will provide a high-quality user experience for metadata entry; moreover, facilitate the user with AI-driven assistance in identifying potential text entries; thus, achieving overall consistency of metadata entries

Project Technical Information

The project requires the team to build i) a system with an interactive interface where metadata can be input and data like stored in csv could be upload and saved in database, ii) a relational database that holds the standard dictionary and vocabulary and iii) an algorithm to recommend information based on user input.

This program is supposed to use React as frontend framework, and FastAPI as backend framework (could be change to other python frameworks). There is no restriction on what brand of relational database to use for this task. The metadata dictionary and standard vocabulary will be provided by the clients

Project 8: What's the Catch?

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

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Professor Swee-Hoon Chuah, UTAS
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Project Description

Students to create a game to be available online (both PC and mobile) where players participate in a fishing trip. Players should see their boat, other players' boats, fish swimming around them, marine zones in the water. If possible, we'd also like the user to have a navigation dashboard that displays how their charts show them they are in or out of the marine zones. As they sail along the water, each player's task is to decide whether, how many and which fish to catch. There should be a tally on one end of the screen, showing their catch, perhaps others' catch, outstanding amount, or other feedback. Ideally some animation when fish is caught, e.g. there's fishing rod action etc. The player will be paid depending on fish caught, at some conversion rate we determine.

We want to capture the number and type of fish caught by the players, in different settings.

Settings should be parameters we (the client) can vary:

- The marine zones the boat is in (e.g. red, green, how close they are to borders)
- The number (lots or few), size (big or small) and type of fish (threatened species?) in the water
- Whether the player can release the fish back
- The number of other boats
- Length of each game
- Number of games to be played
- Conversion rate for payment
- Messages which we can pop up for the players at different intervals (to resemble a mobile phone or app notification)

Project Technical Information

Ideally there is a weblink which can be given to participants, similar to what is offered by the oTree platform.

The software should be able to generate different links for different treatments, corresponding to the different settings/parameters that we can vary. The outcome to be captured by the software is the number and type of fish caught, the time when caught, where the fish was caught (in or out of zone/spatial proximity to zone), if fish is release and the time when released (if this is allowed).

Project 9: Omnicore Backup Manager

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Sam Horton, OMNICORE
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Project Description

Omnicore Backup Manager is to be a UI-based system to assist in the automation, management, and recovery of application backups. This system is targeted towards backup management for web-based products, such as SaaS (Software as a Service) applications, or more simple use-cases such as for websites.

Omnicore Backup Manager should be capable of backing up folders and files within the application's file system or working environment, as well as the application's database(s). Backups and backup schedules should be highly configurable, with users being able to plan and create backups for either whole systems, or segments of databases and subsets of file paths.

Users should be able to rollback to previously backed-up versions of the system both in the file system and database, or optionally should be able choose to only the application's files or database individually.

Project Technical Information

System must be primarily developed for usage on Linux operating systems and file systems, with Windows secondarily kept in mind, using core web technologies such as PHP. It should be built to support at least MySQL databases.

Project 10: Volunteer On-Boarding System (VOBS)

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Sam, David, Sushmita and Chunnian, TechUp Tasmania

Email: techuptas@gmail.com

Sam Horton, OMNICORE

Email: sam.horton@omnicore.com.au

Project Description

The Volunteer On-Boarding System (VOBS) is to be a cloud-based training system to provide effective and measurable methods for introducing new volunteers to an organisation. The system will allow organisations to create customisable on-boarding processes to best fit within their existing organisational activities and processes.

VOBS will allow organisations to construct their processes using a combination of training components, such as sections that provide information regarding the organisation's internal operations (eg. policies, health and safety guidelines, etc.), quiz questions to assess a volunteer's understanding of the newly introduced knowledge, and to track the levels of training volunteers have completed for compliance.

VOBS will be built to accommodate the intake for both short-term and long-term volunteering. For example, VOBS should support on-boarding and training for those who wish to contribute on an operational level to the organisation, as well as one-time activities such as events.

Project Technical Information

For consistency and compatibility purposes, this project should be built with standard core web technologies and languages, such as HTML, CSS, JS, PHP, and MySQL. Usage of some libraries and frameworks may be discussed to assist in development.

Project 11: Volunteer Activity Tracker (VAT)

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Sam, David, Sushmita and Chunnian, TechUp Tasmania

Email: techuptas@gmail.com

Sam Horton, OMNICORE

Email: sam.horton@omnicore.com.au

Project Description

The Volunteer Activity Tracker (VAT) is to be an online application to assist organisations in tracking how volunteers spend their time participating within an organisation. VAT will allow volunteers to track the amount of time they contribute to certain activities via time sheeting-like interfaces. VAT will be able to generate analytics and overviews to give organisations a better insight and understanding of how volunteers and volunteering teams engage with different activities within the organisation, with the aim that these insights will help the organisation plan and optimise future volunteering roles and activities.

In addition to giving insights about the organisation's operations, VAT will also be able to provide summary reports for each volunteer to assist volunteering managers and supervisors to be able to write letters of completion, references, and recommendations for the volunteer. VAT will be able to break down how a volunteer has spent their time within the organisation and generate analytics that highlight their key contributions to the organisation, with potential that the system could eventually help generate simple reference drafts automatically.

Project Technical Information

For consistency and compatibility purposes, this project should be built with standard core web technologies and languages, such as HTML, CSS, JS, PHP, and MySQL. Usage of some libraries and frameworks may be discussed to assist in development.

Project 12: TAS Test Data Dashboard

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Renjie Li and Guan Huang, ICT, UTAS
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Phone: 0420460220

Project Description

Background

TAS Test is a well-developed online test for collecting video and cognitive data used for dementia study. Till now, more than 3,000 people have used TAS Test and through TAS Test, we have collected huge amount of data, including video, audio, other number-based data.

Objective

We propose a project to create a web-based, data management dashboard application to support TAS Test in data management perspective. The main objective is to allow non-technical users to extract useful information from the application, without knowing too much about the raw data.

Main Function Requirements of the App

- Allow users to extract different useful information (been processed data) from the application.
- Give different users different access to different data.
- Should have some data visualization through simple filtering functions in the front end.

Project Technical Information

This is a complete web application development project where students must create a web application from the ground up, including the front-end, backend, and database. The preferred hosting location is the utas server, and students are given the freedom to choose their preferred front-end framework (Angular, React, Vue), backend (Django, Spring Boot, FastAPI), and database (MySQL 8).

Project 13: Language Identification

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Mr Alan Gifford, President of the Association for the Identification of Spoken Language Inc., SES
Email: algiff1942@gmail.com
Phone: 0447 250 945

Project Description

The 2023 Project will focus on up-grades and improvements to software already developed by a Utas Discipline of ICT School of Technology, Environment and Design third year student team.

The primary foci of the software development and improvements will address:

- the current slow speed of the identification of unrecognised non-English languages with the aim of significantly faster identification
- a redesign of the “invitation to speak” graphics
- improved user interface with regard for the particular emergency environment in which the software will be employed
- the ability of the operator to manually input a known language other than English (this feature would by-pass identification by the software to allow the operator to go directly to statements and questions in the recognized language)
- a review of existing embedded identifiable languages with the aim of adding other highly represented language groups found within the community
- coded casualty identification linked to recorded questions and answers (that is, the recorded answers to questions can be linked to individual casualties according to their medical conditions)
- an assessment of the capacity (current and future) of the software to identify additional languages, at the request of the client
- the operational dependence on the internet with a view to possible greater independence, so necessary for operations in remote and challenging environments
- a schedule of regular progress reporting throughout the year
- project planning which will be collaborative with the Association and inclusive as appropriate
- possible applications of the software in environments and situations other than emergency settings

It is anticipated the 2023 team could be required to trial and test the improved software in simulated emergency situations and conditions. All costs associated with any such exercises will be met by the client.

This project will challenge the team members, giving them a rare opportunity to work with a World-first cutting-edge invention.

The existing software in its present format is to be developed and improved for use in emergency settings. The aim is to achieve an “industry ready” standard which, when fully operational, will save lives and reduce trauma and fear.

The Association recognises the potential for the software to be used in many other settings. These applications will not form part of the proposed project.

The Association is committed to the view that communication between people regardless of their spoken languages will remove barriers and discrimination enhancing inclusivity and understanding.

Project Technical Information

The project team will be required to:

- work with existing software on existing platforms
- make improvements as identified by the client, within the time-frame of the project and the capability of the team
- to make recommendations on hardware and systems

Project 15: Secure Remote 3D Printing

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
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Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Lachlan Tucher
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Project Description

Short form: A desktop application to securely access 3D printing data from a remote server and interface with a local 3D printing device while preventing unauthorised copying or use of data. The goal is to allow purchase of 3D models on a per use basis and to provide intellectual property protection for 3D model designers.

Background: 3D printing has developed to the point where it is now a cost-effective alternative to traditional manufacturing. The primary advantage of 3D printing over traditional manufacturing is rapid scalability, A 3D printing set up can switch between different products and produce new products without the months long retooling and workforce training processes needed by factory-based manufacturing. The primary disadvantage preventing general uptake is seen to be the high capital costs per device. I disagree with this analysis. After talking to manufacturers and product designers I've concluded that the greatest limitation preventing general use of 3D printing is the fear of intellectual property theft.

Traditional manufacturing offers intellectual property security through hardware protection, the machine tooling used for manufacturing a product. The product cannot be accurately replicated without this machine tooling thus to protect their intellectual property a company simply needs to maintain possession of their hardware and schematics for construction of their hardware.

With 3D printing however, all that is needed to perfectly duplicate a product is the 3D file that represents the product. Companies are unwilling to provide such files to manufacturers as they can easily be stolen. Similarly small businesses and individual designers suffer from rampant intellectual property theft, typically they upload their design to an online 3D design store in the form of a .stl file, a person then purchases the design and proceeds to sell it on other websites, robbing the original designer of their revenue. This means that small designers have to increase their prices to compensate for losses or limit themselves to high price commissioned designs. Often small designers are forced to exit the market as they're unable to compete when others rip off their designs.

The result is that 3D printing is only an effective manufacturing technique for boutique commission items and very large companies that are able to keep their design, manufacturing, and logistics all in-house.

Problem: Poor intellectual property protection limits the uptake and feasibility of 3D printing technology on a small to medium business scale.

Solution: Develop a platform that can allow manufacturers to print 3D designs while maintaining security of 3D printing intellectual property

Method: Create an application that interfaces with 3D printing devices, controlling them according to encrypted instructions from a remote server that maintains security over the intellectual property.

As the intellectual property is never transferred in full it reduces the risk of theft and resale, thus protecting small designers and enabling companies to take advantage of 3D printing technology without fear of theft.

Note: I'm well aware that perfect protection is not possible, there will always be a way to record the instructions given to a local device from the RAM, to reverse engineer a print by scanning a finished product etc. At the very least what this aims for is a kind of security theatre whereby theft is made slightly harder and legitimate use is made easier. We aim to emulate Steam's process which streamlined the process of purchasing games while at the same time making piracy slightly harder. As a result, many people changed to purchasing games on Steam instead of pirating.

This is in contrast with EAs anti-piracy policy which put restrictive DRM on games that made even legitimate copies difficult to use.

Goal: develop a client-side desktop application that can interface with a remote server and a local 3D printing device to streamline the purchase and printing of a 3D design while protecting the design from intellectual property theft.

Suggested approach:

Server: A remote server containing a database of pre-sliced 3D printing files for a specific model and printer set-up.

Client: a local computer that interfaces with a 3D printer.

Local device: A 3D printer controlled from the Client (model to be determined)

Basic functionality: Server-side application should be able to interface with the client-side application in the following way. The client-side application receives a list of available products from the server, updated regularly. Using the client-side application a user can select a product from this list and request print authorisation. Print authorisation request is sent from client to server. Authorisation requests should include the requested model, n number of prints requested and a unique identifier key for the user requesting authorisation.

If authorisation is approved by the server side the number of authorised prints for the specific user and model is increased accordingly. This is recorded on both the server and client side.

Once authorisation is approved a client-side user should be able to select the approved product from the same list of available products as before and select print. The client-side application should then interface with the local device and run any necessary pre-printing processes. The client-side application should then prompt the user to ensure that the local device is ready to print, the user can choose to proceed or cancel. If the user selects proceed the client requests printing data from the server, the server first checks if printing authorisation has been granted, if this check is cleared it proceeds to reduce print authorisation by 1 and flags “print in process” it then sends printing data to the client. The client receives the printing data and interfaces with the local device to print the selected product.

Project Technical Information

C# will be used to code the desktop application of this project, and Visual Studio should be used as an IDE. Database management is also needed for this project on the server side, and so SQL will be used to create and manage the databases. Security is an important concern for this project, and so secure practices and technologies such as writing safe SQL, hashing passwords, and offering 2FA login will be required for the project. Version control software, such as Git, will be useful for managing the progress of the project. There are currently no existing systems for this project, and so it will be built from scratch. Being able to interface with a 3D printing device will also be necessary, and so studying how to interface with the device through code will be needed for the project.

Jack Barnes will be the contact person for specific technical guidance. Contact details will be provided at the onset of the project. Lachlan Tucker will be the main contact person. He will provide students with any equipment/software that they need for the project. Requests should be made by email and costs will be covered by Lachlan.

We aim to be as flexible as possible while maintaining effective guidance. If students disagree with our suggested methods, we encourage you to communicate this to us, we are happy to consider any proposed alternatives.

Due to harmful fumes given off by 3D printing resin, students will be limited to desktop filament-based printers. This will only change if approved by the unit coordinator and appropriate safety measures to the satisfaction of the university and Lachlan are implemented. For example, use and storage of resin within an active fume cabinet.

Foreseeable risks include contact burns if the “hot end” of the printer (the part used to melt filament for printing) is touched during or shortly after printing. The printer model to be used for testing will be decided by consultation after the project start. Ease of interface is the first priority for choosing a model, initial equipment budget is 10,000 AUD. Equipment budget may be expanded if deemed necessary.

If equipment storage and use at the university is unavailable it will be stored at Lachlan’s home. In this case remote access via a dedicated computer and a webcam feed for monitoring the equipment will be provided. Lachlan will also make himself available for any necessary physical interaction with the equipment. As this is a residence not a business students may access the equipment only with approval from the university and during regular business hours under supervision by Lachlan.

Weekly meetings will be expected in the beginning for the purpose of cohesion. These will be reduced as needed. Students will be expected to keep records of the work they perform.

Project 16: Smart Event Booking

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

Kevin Ding, Healthy Shack PTY. LTD
Email: kevin.ding@healthyshack.tech
Phone: +61450975766

Project Description

HEALTHY SHACK PTY.LTD, starts a new online business that web application which connects customers and event suppliers. The company has now decided to develop online event booking system (OEBS) which has multiple services with multiple hosts.

The OEBS has three different types of users:

- Client – a customer who want to book services to combine one event.
- Merchants – a supplier who provide multiple services.
- System Manager – a manager who manages the OEBS

To use the OEBS, both client and merchant must first register into the system by providing their details including name, email address, mobile phone number, and the postal address. To be registered as a merchant, a user provides their ABN number as an additional mandatory information.

Step 1 is to redesign/improve and plan for the web site including Home, Registration, Finding an event, Booking process, Review page for client, Dashboard for System Manager, Dashboard for Merchants, User Account Page and Database design. In this planning and designing stage, students need to plan for transfer database from Azure to AWS services.

Home Page

This is the starting / entry point to the OEBS system which will have:

- Search section to find the available merchant
- A link to a registration page
- Login/out section

The login/logout section needs to authenticate a user

Registration Page

This is where new users can register to use the system. Proper input validation must be applied at this point including:

- Password check – double entry
- Password is
 - ✧ 6 to 20 character in length
 - ✧ Contains at least 1 lower case letter, 1 uppercase letter, 1 number and one of following special characters ! @ # \$ %
- Merchant must enter their ABN number and upload the authority document to confirm the ABN number.

The registration page stores the detailed customer data.

Find an Event

A client can search event suppliers by specifying the city, event start date*(time option), event end date*(time option), event type, the number of people, sitted or standing* and budget. The system displayed all available services based on their search condition and also can check the details of the service – price, capacity on sitted or standing, the rate of merchants and the rate of the service. The categories of service include venue hire, catering service, Florist, Host and photographers etc. The event should automatically produce and given a unique name. The unique name can be edited by the client. The shopping cart can divide based on the categories and the event.

When client searches the event, following validation is required.

- Location of service are required
- Event start /end date is required
- Number of the guests is required
- Sitted or standing on capacity is required
- Event end date should be after the event start date

Booking Process

Once a client finds the service, he can send a booking request to the merchant. To send a request, the client must register the system first then login to the system for the further process. When the client requests a booking, they can check the event start/end date, the number of guests, client requirement and total price, and also requires inputting the guest details – First name, Last name, email address and mobile number. Once all the details are confirmed, the request is sent to the merchant.

The client can check all the bookings they have made so far and contact the merchant. The client can cancel the booking only when a merchant has not confirmed the booking yet / payment has not been made. The payment only can be processed when the booking is confirmed by the merchant.

Once booking is confirmed by the merchant, the client can process the next step. In the case of 'rejected' they can see the reason why the booking request has been reject by the merchant. In the case of 'accepted', they can process the payment by providing their credit card details and amount they are going to pay and write a review for this stay. The book confirm letter will send to the client email address.

Review page for client

The client can see all the reviews for the service. Client can leave their review. They are allowed to edit or delete Only her review(s).

Inbox list page for client

The client can see all the messages that clients sent to including replies from merchant.

Dashboard for System Manager

Once the system manager login, manager can see the dashboard with all information – the number of services, the number of reviews, the number of new requests and total number of requests, the number of pending on payment and completed payment, and the number of user (merchants, clients and total users).

- Service list: The system manager can see all the list of services, edit the details of the service and delete the service.
- Booking list: The system manager can see all the booking list with the details (services, event start/ end date, payment status, booking status). The system manager can cancel the booking and view reason if the booking is rejected. A manager also can contact the merchant and client.
- Review list: A manager can see all the reviews and delete the review.
- Inbox list: A manager can see all the message and check whether they have read the message or not.
- User list: A manager can see all the users list and change their access level. The manager also can add new user and delete existing user.

Dashboard for Merchants

This is where the merchant creates, edits or removes items in the list of services that will be available for selection by the client to book service. Through the dashboard, the merchant also can check the review rates. The rates are mean score on a 0-5 scale which is calculated as: the sum of ratings / total number of reviews. Once a merchant login to the system, the merchant can see the dashboard which displays all the information – the number of service(s) he shared, the review he received, the number of reviews received, total request and the number of new requests. The merchant also can perform the actions below:

- Manage service: A merchant can share a new service, edit and delete existing house. When a new house is added, the following information is required: house name, brief description of the service.
- Manage request: A merchant can see all the booking request received. He can decide he accepts or rejects the request. But the merchant should give a reason when he rejects the request.
- Review list: A merchant can see the rates that he received from the clients and their reviews.
- Inbox: A host can see all the message received from the client can reply and reply back to the corresponding client.

User Account Page

The page can only be accessed while a user is logged in. Here a user can view their account details including the name, email address, mobile, and post address (and the ABN number for a host).

This page will retrieve and update a user's account details as required. Once the merchant needs to change the ABN, they need to upload the new authority document to confirm.

Database Design

Students are required to design the database tables to complete the database design.

We will provide further information about design and detailed function

For current website - <https://www.destinationtas.com.au/>

Project Technical Information

Front end language: React
Server side language: c#, platform asp.net mvc/ .net core
Database: SQL server/ my sql
Deployment/ application host: AWS Services
Payment and Login Authentication: Ongoing
Multiple API may applied

Project 17: TAS AR

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

Kevin Ding, Healthy Shack PTY. LTD
Email: kevin.ding@healthyshack.tech
Phone: +61450975766

Project Description

HEALTHY SHACK PTY.LTD started developing a new mobile application connecting tourists and historical buildings.

TasAR is a heritage sustainable economic technology tool that builds on heritage open data by using Augmented Reality (AR), when travellers use TasAR on their mobile phones, they will understand the richness of all the places they visit history and heritage. It creates a virtual reality experience for users visiting Hobart's historic sites by mixing reality in a real-time interactive experience. The app uses technology-enhanced visual orientation and augmented reality to show what historic sites have looked like historically. TasAR highlights unique features that create an enhanced time travel experience value for customers of Tasmanian history and culture The app can interact with images, audio and video.

Users can identify scenes by scanning historical buildings and tourist attractions and give corresponding feedback according to the selection of the timeline.

Students who have studied “Virtual and Mixed Reality Technology KIT208” are strongly encouraged to participate in this project to improve the understanding and high-level instruction of AR.

For project demo, please refer -

<https://drive.google.com/file/d/1Mqzy8cZllqXygxBA2XQQrcpzAzkUFwSp/view?usp=sharing>

Project Technical Information

Server side: language: c#,
Platform: Unity & Vuforia
Deployment/ Application host: ongoing
Payment and Login Authentication: Ongoing
Multiple API may apply

Project 18: Number Plate Reading

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Martin Bleasel (From the Company Drewca Investments Pty Ltd)
Email: martin@bleasel.com
Phone: 0438 589 248

Project Description

Use a number plate reading (ANPR) camera to determine if parkers are paying for tickets:

A number plate reading camera will read the number plate and direction of a car entering or leaving a carpark. Software written will obtain this information from the camera and compare it to the ticket machine information. The ticket machine (or associated database) will contain information regarding the registration number and the duration of time paid for. When people enter the car park, they enter their number plate information and pay for a period of time. The software developed will know which cars have entered and exited the car park, how long each car has paid for and by extension which cars are staying beyond their purchased time. The software will hopefully be able to notify patrolling vehicles of infringing customers once certain thresholds are met. This project will reduce the requirement of companies to constantly patrol car parks on a random basis and have them only patrol when they are needed.

Project Technical Information

Preferably the software is written in a language that can be compiled and run on multiple platforms if required i.e, windows, Linux or Mac OS. It is also preferable that the language should not include pointers (too hard to read the code).

The software will likely need to interface with a number plate reading camera. There are a number of choices available. The Milesight Camera appears to have multiple and open interface options available to choose from (TCP IP, Http POST and GET, Real Time Streaming Protocol). Other cameras include Hikvision ANPR and LTS LPR.

The software will likely need to create a local database of cars entering and leaving as well as interfacing with a database containing payment information (or communicate directly with the ticketing machine). The software should be written in such a way as it can interface with various databases without the need for doing a massive re-write of code.

Project 19: Virtual Microscopy

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

Dr Jamie Chapman (Histology Lecturer and Project Lead) and Mr Jeremy O'Reilly (Educational Developer, Administrator of UTAS VMC)
Email: jamie.chapman@utas.edu.au Phone: 6226 2916, Medical Sciences Precinct 2, Hobart
Email: jeremy.oreilly@utas.edu.au Phone: 6226 4743, Medical Sciences Precinct 2, Hobart

Project Description

COVID highlighted the need for agile and flexible ways in which to engage students – for medical and other science-based subjects where the use of microscopes was required, this proved very challenging. The Tasmanian School of Medicine (TSoM) has been developing its own virtual microscopy (VM) system, called the UTAS Virtual Microscopy Collection (vmc.utas.edu.au), which uses the Google Maps API to present virtual representations of physical glass slides. These slides work like a Google Map and allow scrolling, zooming and annotation – thereby extending the capability of a traditional microscope. This has enabled hundreds of students to engage with these resources while isolated, and allowed staff to generate effective and authentic teaching resources.

Recently, our team was awarded a College of Health & Medicine infrastructure grant that enabled us to purchase a new slide scanner to increase and improve our original collection of VM slides (most of which were originally generated in 2006). The current VM system does not handle the new virtual slide file format that the slide scanner outputs, while it also lacks an administrator end interface to allow staff to upload slides, sort, order, create folders, etc...

This project will create a VM system either based upon our existing technology or upon new available open technology (e.g., OpenSlide). The VM system will have an open, findable interface with public slides, a closed interface with password access for selected users (e.g., UTAS staff and students), and an administration interface to allow for the uploading and management of the slide database.

The new VM system developed in this project will allow the TSoM to engage with staff within the College, within UTAS, within Tasmanian schools, and, through its public interface, with the world.

Project Technical Information

The system will be hosted on a university virtual webserver, and so should meet UTAS requirements for such systems. The current system is implemented on a virtual machine running

a Red Hat Enterprise Linux (RHEL) architecture, using a Mariadb database, PHP html pre-processor and an Apache webserver. The server architecture and webserver components need to be able to be maintained by ITS via its Puppet service, to ensure that the service remains secure, up-to-date and patched. Any proposed changes would need to meet the maintenance and security requirements set by ITS.

The current service depends upon the Google Maps API to display and interact with the digital slide images. This Google Maps API service has some limitations, in terms of the digital image formats it supports and the ways the images can be manipulated by users. (For example it is not currently possible to rotate images arbitrarily).

The Virtual Microscope Collection Service has only a partially developed management interface. Further development or re-development of that interface could also be included in the scope of the project(s).

Depending upon the solutions created for managing and displaying digital images, a service that converts high resolution digital images created by the UTAS slide scanners into formats that can be accessed by the VMC service may need to be developed. This could include a service to academic staff to upload raw image scan files for automatic processing online

It is envisaged that the service that results from this project could include:

- Allow authorised students to view, zoom in and out, rotate and annotate high resolution digital histology images
- Enable authorised staff to manage and annotate digital histology images for different student cohorts
- Upload and manage new digitally scanned images.
- Documentation of all services created for both users, managers and technical maintenance & development purposes
- The resulting services will require integration of html, css, javascript, php, ajax/api, database/SQL components.

The services developed will need to support authenticated access, that allows the use of UTAS single-sign-on credentials, and could accommodate future public access account creation and access for public education (eg schools based) projects.

Project 20: Swerdonia: The Quest for the Blade

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

Lake Hopkins
Preferred contact via Discord
Email: lachlan.hopkins@utas.edu.au
Discord: Lachee#9999
Phone: 0472 996 819
Location: Variable but in general anywhere on Sandy Bay campus.
Backup Alt Email: lachlan.h@hotmail.com

Project Description

The project is a 2D metrovania style hack and slash revolved around collecting swords of various abilities and navigating your way through a level/s to find the ultimate blade of Swerdonia. This project is fairly free when it comes to direction, but there are some requirements that will be expanded on later with the group:

1. The player collects swords to progress through levels
2. Minimum 4 swords, two being a basic sword and a gapple sword. Rest are to groups interpretation.
3. Hack and slash with tight platforming.
4. Various enemies with different attack patterns
5. Minimum 10 minute worth of gameplay
6. Controller Support.

The general inspiration of the game is metrovania and the comic swordscomic.com

Project Technical Information

This project will be fairly free-form but there are some technical requirements:

- Unity3D (specific version is whatever is in labs for convenience to all)
- C#
- Git & GitLab (the project will be hosted in a private Gitlab. It is expected good git management and version control practices will be upheld)

- Game must work on Windows 10
- Game must work with Keyboard and Controller. Ideally PS4 controller but what one is support is not strict.

Project 21: Patient Management System

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Clients

Jessie Hou and Pamela Wang, My IT Studio

Email: goodtechnicsolution@gmail.com

Phone: 03 6169 5503

Project Description

Background

By having all patient information in one centralized location, healthcare providers can access a patient's complete medical history, including past diagnoses, treatments, and test results, allowing for more informed and effective care. In addition, there are strict regulations regarding the storage and management of patient medical records in Australia, a patient management system helps medical organizations meet these regulatory requirements. Currently, there are lots of application for the western medicine, this project aims to help Chinese Medicine Clinic to customize the suitable patient management application.

Objective

The main objective is to create a web-based, user-friendly application to help the Chinese Medicine organization operate the business smoothly.

- Increase the efficiency of the organization
- Enhance the patient experience
- Compliance with the regulations and make sure the data safety

Requirements

1. Client-side UI design for the desktop and mobile; Admin side UI design for the desktop.
2. The customer can fill in the online form as new customer registration.
3. If the new customer calls the receptionist, the receptionist can text the register link to the mobile phone.
4. The customer can book an appointment online, select the time and service provider, view unavailable times for already booked appointments, and have a backend system for viewing all customer appointments.
5. The form should be different based on the consultation type, for example: therapy and consultation.

6. The doctor can fetch the document of the customer and fill in the treatment information, including (prescription, insurance sheet and observation description) .
7. The customers can access their own online form, and make sure it's secure. Filling some fields and signature if needed.
8. The major pain area of the body can be demonstrated vividly. It's better to show 3D picture of the body, and the patient can point the pain area.
9. A landing page for the marketing promotion, which needs to consider the SEO optimization.
10. Research about the policy of the medical organization, for example: the hosting policy and data security policy.
11. Administration Dashboard. For booking feature, the admin can modify the schedule of different practisers. For the appointment, the admin can change or cancel the appointment for the customer. For the patient record, there are different access for different role.
12. Scalability needs to be considered. For example, the medical organization usually has several branches.

Project Technical Information

The fronted language preferred : React.js/Next.js ; The component library preferred: MUI
The backend language preferred : Django, Spring Boot, FastAPI
The database preferred: MariaDB, MySQL, PostgreSQL

Project 22: “STUDY” -- A Virtual Classroom & Opensource Education Platform

Project Location: Hobart ☒

Launceston ☐

Intellectual Property	Yes	No
Will the client retain all intellectual property associated with this project? <i>Note: If YES, additional Intellectual Property forms will be required for signing</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Confidentiality	Yes	No
Will the students need to access confidential data? <i>Note: If YES, additional Confidentiality forms will be required for signing.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Clients

Mr. Jack Hogarth, Mechatronic Engineer/Research Associate, UTAS
Email: Jack.Hogarth@utas.edu.au
Phone: 0475131371

Project Description

STUDY:

Many of you, at some stage in your educational journey, will have stumbled into a [Khan Academy](#) (or similar) video on YouTube. Some of these online educators provide the best educational content available, and their content often supplements/is used in place of existing institutions' more archaic teaching methods (some of which are still valid); this project seeks to empower this community of online educators.

The project, in essence, is to attempt to build the ultimate “VR Classroom” for digital content creators of this sort. META has its own version of this (kind of) in development, “[Meta Quest Home Office](#)” – although I don’t believe in them, and genuinely believe we can do better ([BONELAB](#) is a far superior platform to build on).

There are several key features I would like to implement in this virtual classroom; much of the success of the project will be based on UI and “Feel” within the space (I have many ideas/small details to share on this front if you were to join the project.):

1. A Whiteboard: i.e. [Math Teacher's Virtual Reality Class In Half-Life Alyx](#) - think OneNote in VR but better ([Xuornal++](#)). (All of your lecturer’s scribbles saved to PDF in real-time). (Much to discuss regarding the Pen/Marker implementation)
2. Bookshelf: A PDF/textbook viewer/editor allowing stored PDFs to be brought into the virtual classroom, should be able to “throw”/display them on the whiteboard, with simple annotation and bookmarking functionality, saving to the original stored PDF.
3. Terminal: A standard PC for browsing web content in a familiar capacity. (This could end up being a “Door” to METAS Home office for version 1.
4. Lectern: essentially a stream deck/control panel for the space.

My intention for this program is to release it as an opensource mod for [BONELAB](#), as part of a

crowdfunding campaign (no payment will be required to download and use the mod - EVER), with all of the money raised in the crowdfunding to be awarded to educators that produce the best educational content and upload it to YouTube as part of a community competition.

Project Technical Information

The app will be a mod for the existing game/platform BONELAB.
The programming language is Unity.
A copy of BONELAB & a Quest 2 will be provided.
[How To Install The Bonelab SDK](#)