Project ID: P7

Project Title: Whizkid Trains – Washing

Project Description: Whizkid Trains is an app containing therapeutic games for autistic children set in a a multiplayer trainset environment. The project is well suited (but not limited to) students in the Bachelor of Games and Interactivity/Bachelor of Computer Science double degree. This is a "blue sky" project where you will conduct research, conceptualise designs and build software to a prototype stage. Project 2 involves developing a MINI game to help autistic children develop the very important independent living skill of WASHING. This stand-alone game will be accessed through the Whizkid Trains app. Whilst being stand alone it may have several parts, such as having a bath or shower, washing hands and brushing teeth. More information here on request: https://docs.google.com/document/d/1uWHaQaYjxRmxx944L7MJKT2HFtoZWD7B5FeZyd4unWo/edit?usp=sharing

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends the research of Marshall's PhD, Chapter 6 here: https://researchbank.swinburne.edu.au/items/104a6ce1-3475-48ee-9119-30a29bc69bb3/1/

****

Project ID: P8

Project Title: Whizkid Trains – Personal Grooming

Project Description: Whizkid Trains is an app containing therapeutic games for autistic children set in a a multiplayer trainset environment. The project is well suited (but not limited to) students in the Bachelor of Games and Interactivity/Bachelor of Computer Science double degree. This is a "blue sky" project where you will conduct research, conceptualise designs and build software to a prototype stage. Project 2 involves developing a MINI game to help autistic children develop the very important independent living skill of PERSONAL GROOMING. This stand-alone game will be accessed through the Whizkid Trains app. Whilst being stand alone it may have several parts, such as blowing your nose, cleaning your ears, brushing hair, using deodorant and putting on clean clothes. More information here on request: https://docs.google.com/document/d/1uWHaQaYjxRmxx944L7MJKT2HFtoZWD7B5FeZyd4unWo/edit?usp=sharing

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends the research of Marshall's PhD, Chapter 6 here: https://researchbank.swinburne.edu.au/items/104a6ce1-3475-48ee-9119-30a29bc69bb3/1/

****

Project ID: P9

Project Title: Whizkid Trains – Clothing

Project Description: Whizkid Trains is an app containing therapeutic games for autistic children set in a a multiplayer trainset environment. The project is well suited (but not limited to) students in the Bachelor of

Games and Interactivity/Bachelor of Computer Science double degree. This is a “blue sky” project where you will conduct research, conceptualise designs and build software to a prototype stage. Project 2 involves developing a MINI game to help autistic children develop the very important independent living skills of getting dressed and managing CLOTHING. This stand-alone game will be accessed through the Whizkid Trains app. Whilst being stand alone it may have several parts, choosing appropriate clothing, growing out of clothes and buying new ones, also and some guidelines about fashion. More information here on request:
https://docs.google.com/document/d/1uWHaQaYjxRmxx944L7MJKT2HFtoZWD7B5FeZyd4unWo/edit?usp=sharing

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends the research of Marshall’s PhD, Chapter 6 here:
https://researchbank.swinburne.edu.au/items/104a6ce1-3475-48ee-9119-30a29bc69bb3/1/

****

Project ID: P10

Project Title: Whizkid Trains – App design and development

Project Description: Click or tap here to enter text. Whizkid Trains is an app containing therapeutic games for autistic children set in a a multiplayer trainset environment. The project is well suited (but not limited to) students in the Bachelor of Games and Interactivity/Bachelor of Computer Science double degree. This is a “blue sky” project where you will conduct research, conceptualise designs and build software to a prototype stage. Project 2 involves developing a MINI game to help autistic children develop one of the most important independent living skills – going to the toilet. This stand-alone game will be accessed through the Whizkid Trains app. More information here on request:
https://docs.google.com/document/d/1uWHaQaYjxRmxx944L7MJKT2HFtoZWD7B5FeZyd4unWo/edit?usp=sharing

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends the research of Marshall’s PhD, Chapter 6 here:
https://researchbank.swinburne.edu.au/items/104a6ce1-3475-48ee-9119-30a29bc69bb3/1/

****

Project ID: P11

Project Title: Building asset location system

Project Description: This project is to develop a system for tracking mobile assets in a multi-story buildings. A battery powered beacon is attached to the asset. Fixed, low powered receivers (typically one on each floor of the building) detect the presence and approximate location of the asset, and communicate the location over the WiFi system of the building, then sending the data to a cloud service. A website displaying asset location within a building floorplan is part of the project. Technologies used: Low power processors incorporating BLE and WiFi; Website development; C software development; PCB

design and manufacture; Very low power design for battery operation; 3D enclosure design and manufacture.

Project Skills: Programming (Software, Mobile and Web Development), Robotics/Electrical

Environment: Microsoft (C#, C++, Windows, and database), Frameworks (Angular, React, Django, Flask, VueJS), Others (Kotlin, Python)

Research component:

****

Project ID: P12

Project Title: Very low powered anemometer

Project Description: Zeltek manufactures environmental monitoring equipment, particularly for marine environments. We wish to incorporate a very low power anemometer (wind speed and direction) into a remote, battery operated weather monitoring system. While there are mechanical anemometers with inherently low power, we would like to use ultrasonic device which has no moving parts, for higher reliability. These also exist, but generally consume too much power for long term battery operation. This project is to develop very low power ultrasonic anemometer, typically consuming less than 20mW. One approach we would like to explore is to use gas flow meter IC components which could be adapted to anemometer applications. This is an opportunity to gain experience in very low power electronics, 3D enclosure design, C sensor programming and sensor interfacing, and sensor calibration.

Project Skills: Programming (Software, Mobile and Web Development), Robotics/Electrical

Environment: Microsoft (C#, C++, Windows, and database)

Research component:

****

Project ID: P19

Project Title: Cisco Lab Exam Collector

Project Description: The University currently uses an internal tool to collect and assess the Skills Exams run at the end of semester. At present this is a multi-tool system developed in PHP and run as a series of consecutive tasks (collect, configure, assess, mark, release) and parallel tasks (collect from multiple devices simulataneously). As part of the next step in development, the University would like to split the collection/configuration process from the remaining tasks, paving the way to allow this system to support our remote partners AND to eventually develop automated lab feedback by students self submitting work. The University would also like to begin the task of converting the system from PHP to Python for better ongoing support and maintenance. This project would involve designing and implementing an updated system that extracts part of the existing code, and re-writes it to be a more generic rather than specialised project. It would involve porting the system to a new language, and testing and evaluating the functionality. The group would be required to work with Swinburne Academic staff to ensure that the output and functionality meet the requirements of the next stage of development including - Verification of system stability for widespread use - Thorough testing to evaluate suitability for concurrent collection of work from multiple students AND properly assigning collection to the appropriate student - Development of UI to ensure ease of use across multiple people with varying levels of skill

Project Skills:

Environment:

Research component:

****

Project ID: P20

Project Title: Internet of Things (IoT) Marketplace – User Interface

Project Description: Design and implement a software container for a Node.js application. This project aims to provide a comprehensive understanding of containerisation technology, specifically focusing on Docker, and its application in modern software development and deployment processes.
Objectives of the project:

1- Understanding Containerisation: Gain a solid understanding of containerisation concepts, benefits, and best practices.
2- Node.js Application Development: Gain a good understanding of Node.js and use an existing Node.js application to be containerised.
3- Docker Implementation: Learn how to create Docker images and containers, and how to manage them effectively.
4- Container Orchestration: Explore basic orchestration techniques using tools like Docker Compose or Kubernetes for managing multi-container applications.

Students will undertake the following activities:
1- Work with key stakeholder to elicit the requirments of the software container.
2- Identify the suitable technologies to develop the software container.
3- Implement the software container.
4- Test and validate the software container aginst the requirments.

Project Skills: Programming (Software, Mobile and Web Development)

Environment: Microsoft (C#, C++, Windows, and database), Oracle (Java and database), Others (Kotlin, Python)

Research component:

****

Project ID: P21

Project Title: Internet of Things (IoT) Marketplace – User Interface

Project Description: Design and develop an Android application as a User Interface (UI) to interact with an Internet of Things (IoT) marketplace. The marketplace has already been developed using blockchain technology. Our developed marketplace allows sharing data produced by IoT with other parties (clients) who are interested in buying such data. This project will focus on developing the front-end UI application to interact with the marketplace for registration, querying, and paying IoT sensors (e.g., cameras, smart phones, wearables, smart meters, vehicles, and medication pills). The key feature of this android application is providing an easy-to-use interface for:

1- IoT sensor registration,

2- Searching and querying registered IoT sensors,
3- Paying and using data provided by IoT sensors.

Students will undertake the following activities:

1- Work with key stakeholder to elicit the requirements and features of the UI Android application.
2- Identify the suitable technologies to develop the UI Android application.
3- Produce a design of the UI application including design of any APIs.
4- Implement the UI Android application.
5- Test and validate the UI Android application against the requirements.

The students will get an exciting opportunity to learn and work on cutting edge technologies such as Internet of Things, Blockchain, App development and Data Analytics.

Project Skills: Programming (Software, Mobile and Web Development)

Environment: Microsoft (C#, C++, Windows, and database), Framework (Angular, React, Django, Flask, VueJS), Others (Kotlin, Python)

Research component:

****

Project ID: P22

Project Title: Blockchain-Based Password Manager

Project Description: A blockchain-based password manager needs to be developed to securely store usernames and password hashes, leveraging blockchain's decentralized and immutable nature for enhanced security. This system will authenticate users with public-private key pairs and provide an option to store passwords both online (on the blockchain) and offline (locally) based on user preferences. Usernames will be encrypted and passwords hashed before storage, using strong cryptographic algorithms. The system will feature a user-friendly interface, allowing users to add, update, delete, and retrieve credentials easily. Ensuring data integrity, preventing unauthorized access, and maintaining a transparent, auditable record of all transactions are key priorities.The password manager will be built on a suitable blockchain platform and involve developing smart contracts for credential management. The front-end will be developed using modern frameworks. Secure local storage mechanisms will be employed for offline passwords. Key non-functional requirements include high performance, scalability, usability, reliability, and compliance with data protection regulations. The project needs rigorous testing, regular updates to ensure a robust and secure system.

Project Skills: Cyber Security, Programming (Software, Mobile and Web Development)

Environment: Framework (Angular, React, Django, Flask, VueJS)

Research component:

****

Project ID: P23

Project Title: Registration System with Payment Module, Questionnaires, and Reporting for Mobile Application (Optional Web-Based)

Project Description: The project aims to develop a versatile registration system primarily for mobile applications, with the option to include a web-based interface. This system will integrate essential features such as a payment module, questionnaires, and robust reporting capabilities. Users can register for events, complete questionnaires, securely process payments, while administrators manage events, registrations, questionnaires, and generate detailed reports. Initial requirement to build a prototype and then a mobile application where user can register to their even and can pay the money.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P24

Project Title: Interactive mobile application to improve privacy awareness of Facebook users

Project Description: Based on a survey of privacy awareness of Facebook users in Bangladesh we have identified areas of improvement and have designed a prototype application to improve privacy awareness. The application presents a video tutorial on a privacy topic and asks scenario baeed quiz questions to evaluate the user's understanding. The protoype is developed in Figma and has been evaluated with the users. A real working application needs to be developed based on the prototype.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P25

Project Title: Mobile game for skill development of domestic workers in Bangladesh

Project Description: The mobile game will be developed based on a skill development training developed for domestic workers in Bangladesh. The training is a paper based training taught in a few days workshop. We plan to develop a mobile game based on the training content so that domestic workers can play the game at their convenient times and learn the skills.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P26

Project Title: Mobile application for financial management for low digitally litterate people

Project Description: The mobile application will help people with very low digital literacy to manage their own finances with a very simple interface. The application should also be designed in a way that helps the users to improve their financial literacy.

Project Skills: Programming (Software, Mobile and Web Development), AI/Machine Learning

Environment:

Research component:

****

Project ID: P27

Project Title: Development of Smart Textiles for Improved Quality of Life and Cognitive Assessment

Project Description: The project aims to develop a smart textile prototype tailored for individuals living with neurological disorders such as Alzheimer's disease, Parkinson's disease, Huntington's disease, multiple sclerosis, stroke, traumatic brain injury and functional neurological disorders. The prototype will amalgamate entertainment, cognitive assessment, and behavioral monitoring functionalities embedded into an interactive textile. By integrating electronics, LEDs, and capacitive touch sensors into a so-called "smart textile", the prototype will offer real-time feedback to user interaction with the visual and audio-based entertainment regions of the textile. Entertainment and engagement are facilitated through interactive games and music playing functionality. At its core, the prototype will serve as a multifaceted tool to enhance the quality of life for individuals with neurological disorders, ranging from monitoring and potential rehabilitation of both physical and cognitive functions. The prototype will serve as a platform for cognitive assessment and behavioral monitoring. A data logging system integrated into the smart textile will record users' behavioral patterns, including the location, frequency, and duration of their interactions with the different smart textile areas. The prototype will enable the development of personalized behavioral profiles. These profiles will inform tailored intervention strategies to optimize care and support for individuals living with neurological disorders.

Project Skills: AI/Machine Learning, Programming (Software, Mobile and Web Development), Robotics/Electrical

Environment: Others (Kotlin, Python)

Research component: The innovation / research lies in the integration of electronics into textile technology to address the complex challenges faced by individuals living with neurological disorders. Unlike traditional approaches, the prototype offers a holistic and customizable approach to enhance the quality of life.Firstly, the integration of entertainment and engagement functionalities within the fabric represents a novel approach to addressing the cognitive, emotional, and physical needs. By embedding interactive games and music playing capabilities directly into the textile, the prototype provides opportunities for cognitive stimulation and emotional well-being in a seamless and intuitive manner. This approach promotes creativity and social interaction, addressing key aspects of well-being often overlooked in traditional care practices. Secondly, the incorporation of cognitive assessment and behavioral monitoring functionalities represents a significant advancement in personalized care. Through the integration of sensors and data logging systems, the prototype captures information about users' interactions, allowing for the development of personalized behavioral profiles. These enables caregivers and healthcare professionals to track individualised disease progression, monitor treatment effectiveness, and tailor interventions. This personalized approach to care represents a paradigm shift

from one-size-fits-all interventions to targeted and responsive support based on real-time data and insights

****

Project ID: P29

Project Title: Development of a mobile app for balance assessment

Project Description: This is a novel project that merges engineering, digital health, and rehabilitation in the field of balance control. Assessment of balance is crucial as an outcome measure and for clinical-decision making in most clinicial populations. However, balance assessment is usually conducted using qualitative measures or tests that suffer of ceiling or floor effects (too easy or too difficult). This project is aimed at developing a mobile app that can be used to objectively quantify balance performance during clinical tests. The mobile app will 1) collect/record mobile phone embedded sensors data (e.g., accelererometer), 2) calculate clinically meaningful measures (e.g., sway area) as well as more advanced metrics of non-linear behaviour and 3) provide a report of the findings (i.e., metrics display). The developed app will have an enormous impact on clinical assessment for a wide range of patients, helping clinicians but also reasearchers in the field of motor control. Also, the app will potentially enable patients to self-asess their rehabilitation progress and/or monitor motor symptoms in patients with diverse neurological conditions.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P30

Project Title: Whizkid Trains – ThinkPlus Game Portal

Project Description: This project involves developing an OPEN WORLD GAME PORTAL in Unity. The client is ThinkPlus and the aim is to gamify parts of their existing curriculum. The purpose of the game portal is to allow children to access a variety of games through a browser-based open world environment. The project is well suited (but not limited to) students in the Bachelor of Games and Interactivity/Bachelor of Computer Science double degree. Students who have completed this project will be eligible for on-going paid work with Education Network Group PTY LTD. ThinkPlus is designed to complement a schools' existing curricula, sitting alongside the existing lessons a child has, growing their capacity to learn their confidence and, as a result, their emotional resilience. ThinkPlus learning tools are developed through education design research. We collaborate with schools and universities to co-design resources using feedback and the latest psychology, education and neuroscience research. ThinkPlus is currently being used by thousands of students and hundreds of teachers in schools around Australia.More about ThinkPlus can be seen here: https://thinkplus.info/

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends Marshall's goal-modelling research http://emotionalgoals.com/

****

Project ID: P31

Project Title: Whizkid Trains – ThinkPlus Neuoplasticity Game

Project Description: This project involves developing a game in Unity to teach children about the concept of NEUROPLACTICITY. The client is ThinkPlus and the aim is to gamify parts of their existing curriculum. The project is well suited (but not limited to) students in the Bachelor of Games and Interactivity/Bachelor of Computer Science double degree. Students who have completed this project will be eligible for on-going paid work with Education Network Group PTY LTDThinkPlus is designed to complement a schools' existing curricula, sitting alongside the existing lessons a child has, growing their capacity to learn their confidence and, as a result, their emotional resilience. ThinkPlus learning tools are developed through education design research. We collaborate with schools and universities to co-design resources using feedback and the latest psychology, education and neuroscience research. ThinkPlus is currently being used by thousands of students and hundreds of teachers in schools around Australia.More about ThinkPlus can be seen here: https://thinkplus.info/

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: This project extends Marshall's goal-modelling research http://emotionalgoals.com/

****

Project ID: P32

Project Title: Greenhouse Gas Carbon Emissions Calculator for Rail vs Road

Project Description: This project will develop a calculation tool able to determine the GHG emissions for freight being carried by rail compared to that being carried on roads. The output shall be a software calculator that can be utilised to compare the carbon emissions impact of shipping freight by rail when selecting a size of container, a volume of products, the weight of goods from a series of defined origins and destinations. This is compared to the GHG emissions derived from heavy duty road transport

Project Skills:

Environment:

Research component:

****

Project ID: P33

Project Title: Automated Requirements and Usage Context Generation using Large Language Models (LLMs)

Project Description: This project focuses on developing an automated solution utilizing Large Language Models (LLMs) to generate system requirements and usage contexts from diverse perspectives, including various user personas. The objective is to streamline the requirements engineering process by leveraging advanced natural language processing capabilities of LLMs. The solution will enable the creation of

detailed and contextually relevant requirements documents, ensuring comprehensive coverage of user needs and system functionalities. By incorporating different personas, the generated requirements will reflect a broad spectrum of user experiences and expectations, thereby enhancing the inclusiveness and usability of the system. In the end, the system should identify any inconsistencies and conflicts between different perspectives, and perform negotitation.

Project Skills: AI/Machine Learning, Programming (Software, Mobile and Web Development)

Environment: Others (Kotlin, Python)

Research component: The research component in the paper is based on the novelty of building such a solution, which doesn't exist as of now.

****

Project ID: P34

Project Title: Spatial data and business location

Project Description: It will test 2 things:1) No permit required under the Planning Scheme for this in particular commercial use (overcoming or avoiding red tape);2) Google maps data by location and checking by keywords, i.e., whether the description of commercial use in the planning scheme is similar or the same as the description on Google Maps via Google My Business. If it is the same and similar and there are about 7-10 businesses in the location under the same description it will be an indication of the commercial cluster. Commercial clusters attract more foot traffic.

Project Skills:

Environment:

Research component:

****

Project ID: P35

Project Title: Total School Platform

Project Description: The target client of this project is the schools of developing countries. This software will present the schools with an interface/form where the schools can provide their information. The software will automatically create their website using the information provided. Schools can update and delete the information in their website using this software. The software also gives feature such as class list management and yearly curriculum data maintenance. The schools can create/ update class lists and curriculum list using the software. This software also provides an account management feature for each schools. The schools can create an account for each student/parent/guardian. The schools can also use this software to send notifications or communicate information with the accounts (student/parent/guardians) as emails and sms. The schools can customize whether they want to send attendance, result and/or other notifications through this software.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P36

Project Title: Handymen App

Project Description: This is a mobile platform where different handymen from different profession can create their profile with their skills, experiences, short bio, contact details and price range for certain jobs. The main advantage of this proposed software product is that the handymen can communicate their information with people using the mobile platform. They can also quote for jobs posted by other users. On the other hand, general users who are not handymen can post their jobs. Handymen can quote for the jobs. Users can also search for list of handymen under certain category and get their contact details from there. They can then manually contact them instead of posting jobs on this platform. There should be a validation process for account creation of the handymen.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component:

****

Project ID: P37

Project Title: Campus Notes

Project Description: The target users of this proposed application are university students of Bangladesh. Usually there are two groups of university students in Bangladesh. One group study the materials and prepare their own notes. They sometimes also highlight important text from the text books of relevant study resources and prepare their own study material. The other group usually collect these notes, either prepared by the students of the same year or notes prepared by students of the previous years. The second group of students usually collect those from friends, local photocopy shops and residential hostels within respective universities. To our knowledge there is no unified platform where these notes are easily available.

Project Skills: Programming (Software, Mobile and Web Development)

Environment:

Research component: