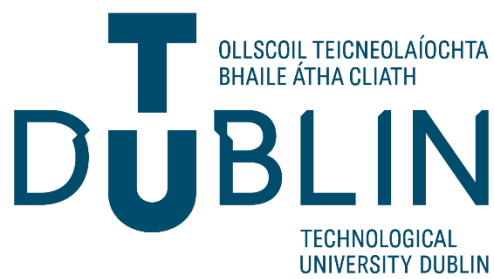


2024

Project Fair



COMPUTER SCIENCE

TUDublin

School of Computer Science

4/16/2024

Project Fair 2024

Project Descriptions

1. Adam Burke C20511903@mytudublin.ie

LudoRules

A learning application specifically designed to help learn to become an official in a sport called Ludosport-Light saber combat. It utilises a simplistic design and best practices and features used in learning tools.

2. Alexandros Tsiogas C20336236@mytudublin.ie

BetterRecs: A Machine Learning Hub for Discovering New Music.

This project aims to create a new way for listeners to find music that they enjoy, using machine learning. This project explores the shortcomings of popular music recommendation systems and aims to address such shortcomings through a new recommendation system. The project focuses on addressing perceived issues in the most widely used music streaming platform – Spotify. In keeping with the theme of music recommendation, the app also has the capability to recommend concerts and events, based on the model's perception of the user's music taste and their geographic location.

3. Ayan Abedin D19125792@mytudublin.ie

Automatic License Plate Detection using Image Processing

The project aims to develop a robust and efficient system for real-time Automatic License Plate Recognition (ALPR) using OpenCV, Python programming, and advanced computer vision techniques. The primary objective is to create a comprehensive solution that automates the identification and processing of license plates within parking management systems. The system uses a computer/Raspberry Pi and a camera for image capture, employing OpenCV and Python for computer vision algorithms. It follows stages of image capture, quality enhancement, identifying license plate areas, character segmentation, and recognition, prioritizing real-time processing on the Raspberry Pi.

4. Ben Johnson c20316733@mytudublin.ie

CleanStreets

CleanStreets mobile application provides a platform for the intelligent management of urban areas and collection of waste across Dublin. The project aims to research and develop a system that allows users to report issues from their locality, to help the relevant authorities / community workers / volunteers amend them. Complete

with analytics, noticeboard, account management and fully interactive mapping and routing features.

5. **Bongani Moyo** C20309081@mytudublin.ie

Language Simplifier

Language Learning app that takes advantage of text summarisation for shortened reading times. Has a quiz component at the end for user to test themselves on what they have learned.

6. **Brandon Lee De Bruyn** D20123654@mytudublin.ie

SkyParse: A Deep Learning approach to celestial object detection in wide-field Sky Surveys

SkyParse harnesses the power of Deep Learning built in TensorFlow to revolutionize the detection of celestial objects in wide-field sky surveys. In an era where astronomical data outpaces analysis capabilities, SkyParse offers an efficient and accurate solution to identify and categorize astronomical objects on an unprecedented scale. Traditional spectroscopic analysis, while precise, is expensive and time-consuming, creating a bottleneck in processing the vast volumes of data generated by modern telescopes. By applying cutting-edge deep learning techniques, SkyParse aims to bridge this gap, enabling rapid, cost-effective analysis without the need for extensive spectroscopic data. This project not only accelerates the pace of astronomical discoveries but also opens new frontiers in the study of the cosmos by identifying anomalies and objects of interest that might otherwise remain undiscovered. SkyParse offering a significant leap forward in the field of astronomy, offering a scalable solution to one of the most pressing challenges in the analysis of celestial data.

7. **Caoimhe McCann** c20365106@mytudublin.ie

Alex App

This project addresses the needs of coaches and players of the 'Old Alex Hockey Club.' Its primary objective was to provide streamlined access to details for upcoming matches and provide an effortless way to create teams, ensuring a seamless experience for the clients through a progressive web application (PWA). The app also provides users with valuable insights by providing them with the rankings of upcoming opponents, which were derived from the current season's results. This empowers players, coaches, and the team to make informed decisions and adequately prepare for matches. Moreover, it provides the club with opposition player and team statistics by analyzing goals scored from web scraping from the Leinster Hockey League. The ranking of Old Alex teams is also calculated and updated at regular intervals using this information.

8. **Chakkarin Laksanakesim** D21125387@mytudublin.ie

Stitch

Stitch is a social media platform with a virtual wardrobe feature including machine learning and AI assistant for personalised outfit needs.

9. Ciaran MacDermott C20384993@mytudublin.ie

Cam-Coord

My project is a home-security focused Android mobile application for managing and controlling IP cameras. It focuses on cameras using the Real Time Streaming Protocol (RTSP) for streaming of video. The camera footage will be sent to a server program hosted on a Cloud virtual machine. A local instance of the same program will run on their laptop or PC to redirect the footage. An Android application serves as the UI. A SQL database is used to store user data, and a REST API will be used for communication between the app and the database.

10. Daniel Kondabarov c20456964@mytudublin.ie

Feathered Homes: Using generative AI to simulate the world of birds

Through the power of generative AI, Feathered Home brings bird photos to life by transforming photos into digital versions of the birds. Providing a fun and educational activity that users can do while they are outside. This project aims to highlight how hundreds of unique game AI can be generated from complex text prompts instead of being manually created by humans.

11. Daniel Mendes c20489272@mytudublin.ie

Mind Magic

Virtual Reality has been invaluable for both accessibility within gaming, as well as learning within gaming. Brain Computer Interfaces have also substantially impacted several different industries by providing a way for users to interact with technology by using their mind. Mind Magic is a video game that takes both of these revolutionary technologies, and combines them together to create an immersive experience that uses the users mind.

Through the use of python, machine learning, networking, the Godot game engine, and an electroencephalogram, this project is able to read the users raw brainwave data, send it to a running python script, and then send the users state or emotion after it has been predicted to the game through a UDP server. An action like blinking takes less than a second to show up in the game, providing a connected and immersive experience.

12. Daniel Waldron c19411092@mytudublin.ie

BotanyLife

Plant recognition based app where users upload their image of a plant and the app will recognise the plant and give extra details based on what plant the user has provided

13. David Davitashvili c20406272@mytudublin.ie

Evolution by Natural Selection VR (ENSVR)

ENSVR is a VR experience where you can spawn creatures, food, and environmental obstacles on a finite terrain, simulate evolution and natural selection, and watch how the survival of the fittest unfolds right around you. The user controls the simulation with a GUI that can be toggled on or off, and with this they may control any parameter of any creature, species, terrain, and food. Random generation of all of these parameters are also an option should it be desired.

The terrain is completely procedural using Perlin noise, therefore the user does not have to manually build the world, but they will have to specify how large and how mountainous they want their world to be. Environmental factors such as temperature and weather are also incorporated so that there is more challenge for life to adapt to.

14. David Kelly c20324901@mytudublin.ie

StaveTime - a sheet music reader app

This application scans sheet music and then plays it back to the user. The aim is to help musicians to read sheet music. It uses Optical Music Recognition (OMR) software to take the information from the page, and convert it into audio format.

15. Dylan Nolan C20485612@mytudublin.ie

Homelessness Assistance Kiosk: A Technological Solution for Real-Time Homelessness Support.

The aim of this project is to develop an innovative kiosk system to assist those experiencing homelessness. In a society where the issue of homelessness is increasingly concerning traditional approaches of support often prove ineffective in delivering quick and efficient aid. The HELP Kiosk aims to narrow this gap by utilising technology to provide immediate and easily accessible assistance. The kiosk, using a Raspberry Pi 4, will function as an interactive device that provides real-time information regarding shelters, food services, and healthcare facilities. The system integrates Geographic Information Systems (GIS) to provide interactive mapping, facilitating users in easily locating resources within their area.

The HELP kiosk, which offers real-time support, is an excellent example of how technology can effectively tackle complex social problems by assisting individuals.

16. Eira Gail Tabaniag c20461286@mytudublin.ie

Study Buddy

A web application aimed to help students in their academics - namely in studying, task management and productivity. Its features include a rich-text editor for creating and editing notes, a task management system allowing users to categorise and organise their to-do's and a study page with a pomodoro timer to help users stay focused and motivated during their study sessions.

17. Emma Jane Power c20305656@mytudublin.ie

Dog Management Application

Many dog owners grapple with the cognitive and logistical challenges associated with the management and care of their canine companions.

The primary aim of this project is to develop a mobile application for dog management that can integrate into the daily routine of dog owners. This application aims to alleviate the mental burden by providing a structured system for storing and accessing dates and appointments. Beyond that, it offers a comprehensive solution by assisting owners in discovering nearby dog amenities, empowering them to explore confidently. Furthermore, the application facilitates remote monitoring of pets at home and ensures owners have peace of mind during their absence. In summary, this project aspires to redefine dog care, offering a streamlined and stress-free experience for all dog owners.

18. Eoin O'Toole Carrick C20310571@mytudublin.ie

Tee2Green

Golf GPS Application that allows users to track distances to the green and other hazards such as bunkers or water while playing golf. As well as store score data for that user's round of golf. The app allows users to view past scores to help see where their game may need improvement to help reduce their scores for future rounds of golf.

19. Ethar Boudouara c20452282@mytudublin.ie

Gohalal

A Responsive Ecommerce webapp that allow meat suppliers to communicate with Restaurants and make Halal suppliers more recognised, it also solves the issue of providing a responsive web app to suppliers who don't have a website as per requested from my client.

20. Gabriel Plaza C20474596@mytudublin.ie

Conductify - A hand gesture recognition application

Conductify harnesses the power of machine learning to allow users to control Spotify musical playback completely hands-free. The project uses 2 different machine learning models to 1) Identify and extract the XYZ coordinates of 21 points on a hand input image, and 2) To take these coordinates and predict which hand gesture it corresponds to. The machine learning models are deployed on a Flask API, and API calls are made from an android application developed using Flutter and dart code. This makes it extremely lightweight.

21. Habeeb Alao c20362766@mytudublin.ie

Kantask - Project Management & Productivity App

Kantask is a project management mobile and web application for individuals and small teams. Kantask allows users to create tasks, log time against tasks, and see analytical insights on a range of data that Kantask gets from the user's inputs. The app will consist of three main pages the dashboard, Kanban and calendar page and a few miscellaneous pages including the sign up, sign in pages and the Kantask pro features pre-payment page where users can purchase Kantask premium via the Stripe integration.

22. Hojun Cho d20124625@mytudublin.ie

Catchya!

Touchable and friend virtual pet game.

23. Ida Bamfi C19304993@mytudublin.ie

WorkSphere: Smart Management System for Employees in Retail

The purpose of project is to develop a smart management application for employees in retail. It is a smartphone application with various employee-based systems. The end deliverable is a fully functioning smart management android application that can be used by employees and management. Employees can clock in and out to work, view and amend their shifts, book time off and record sick leave. The employees will be able to clock using their smartphones and a notification will be sent to the application that the employee has clocked in. The system includes a notification board where employees and management can send updates to one another. The employee's estimated pay will also be calculated based off the hours worked. They can also input their weekly sales targets and record whether they have reached their sales target by the end of the week.

24. Jack O'Shea c20371873@mytudublin.ie

Oscar: Overview System for Conceptual Analysis and Representation

Oscar is a data processing and summarisation tool designed around simplifying the process of interacting with data. It allows users to merge datasets, filter datasets using the UI, show mapping of data they have access to and uses generative AI to simplify configurations and setup. It uses an API that supports connections to any SQL database or S3 compatible storage and allows the use of any generative AI.

25. Jade Higgins C19365731@mytudublin.ie

Anois is Arís - A Web Application for Predicting Endangered Species Distributions Across Ireland

Anois is Arís is a web application dedicated to predicting the distributions of endangered species in Ireland, under current and future climate conditions. By leveraging species distribution models (SDMs) and incorporating user-contributed data, this platform provides a unique tool for visualizing the impact of climate change on Ireland's endangered species. It features interactive maps and graphs for exploring current conditions, historical data, and future climate projections, aiming to engage users in conservation efforts and enhance understanding of biodiversity changes within the region.

26. James Broderick C20314026@mytudubline.ie

Space mouse too expensive. . .just DIY it.

The project consists of software to link into Solid Edge and determine what environment is in use, such as sketch or 3D view or assembly, the software then links into the screen and macro keyboard to update them to the appropriate key mapping and accompanying icons on the screen when the end user switches between environments in solid edge, or potentiality switching between entire programs such as Chrome to vscode would give different key mappings and icons.

27. James Clarke C20375736@mytudublin.ie

Easy-Scope

Easy-Scope is a telescope mount controlled with a mobile application. Using the application, the user can control where the telescope points, and select from a range of stars and planets which the telescope will point at and track.

28. Jamie Heffernan c20483462@mytudublin.ie

CookSmart

CookSmart is an AI enhanced Recipe Management System application for iPhone which allows a user to photograph a selection of ingredients and use machine learning to generate a recipe using those ingredients.

29. Jaycel Estrellado C20372876@mytudublin.ie

Person-Detection Algorithms for Fisheye Lenses

This project is to investigate the functionality of algorithms on lower-power computing devices, with a focus on extracting position and movement boxes for individuals from top-view fisheye images.

30. Joshua AL Rasbi c20356061@mytudublin.ie

SignIT

SignIT just as its name suggests will allow users to perform sign gestures based on ASL. The project is a React App that works as a front end that will extract key points from the live camera feed and will post it towards the backend housing the prediction models that were created to perform predictions on which gesture was performed.

31. Justine Langridge C20333476@mytudublin.ie

Skin Deep

A skincare product recommendation web app combined with an AI model focusing on ingredients to show users what they really should and shouldn't be putting on their skin.

32. Kah Siong Chong D20123833@mytudublin.ie

Shrinking My AI

The ever-growing demand for real-time AI applications on resource-constrained edge devices, like the Nvidia Jetson series, necessitates innovative solutions. This project investigates methods to optimize cutting-edge AI models for deployment on such devices. My research focuses on finding an approach that can significantly improve computational efficiency while preserving acceptable levels of accuracy. This will ultimately enhance the cost-effectiveness of edge-based people-counting solutions.

The project explores:

- * Model Shrinking - Utilizing post-training quantization techniques with ONNX and TensorRT APIs to reduce model memory footprint and computational complexity.
- * Benchmarking - Evaluating performance (FPS) on a people-counting system powered by cutting-edge algorithms like RAPiD and correlation tracking.

* Inference Engine Optimization - Comparing various inference engines and execution providers (Pytorch+CUDA, ONNX+CUDA, ONNX+TensorRT, TensorRT) to achieve optimal performance on edge devices.

33. Khushboo Jayan D20123668@mytudublin.ie

Drone attack framework

Framework helps detect the vendor manufacturer of the station connected to a network capture a wpa handshake in a drone and detect the possible vulnerability and perform attacks example DOS attack. It will open source allowing cybersecurity enthusiasts add more modules in future.

34. Kieran Gregg Retardo Silada C20483514@mytudublin.ie

PayYourWay: Mobile Self-Checkout System

PayYourWay is a mobile technology solution that aims to empower both retailers and customers in the way they shop. In the contemporary retail sector landscape, technology is being embraced rapidly with the likes of Amazon Go spearheading automation and self-checkout functionalities. PayYourWay is offering a cost-effective and fully software approach that can appeal to small to medium retailers. This is done through a customers mobile device with the ability to shop, scan and pay for their shopping, all in one app. With location-based tracking, retailers can be sure that nearby customers will easily find their store and start scanning with the first product they see. Personalised shopping experience can be had with product recommendations and tracked expenditure is made easier with digital receipts.

35. Luke O'Shea Scanlan C19300696@mytudublin.ie

GAA Stat

This project (GAA Stat) aims to leverage modern technologies to facilitate efficient data collection in a game of Gaelic Football, Hurling and Camogie. The fast-paced nature of these sports constitutes an equally fast application with a cohesive user interface to allow a user to effectively collect information and make data-driven decisions to ameliorate their teams' performance.

36. Matthew Jungmann C20376686@mytudublin.ie

Peitril

Peitril is a crowd-source fuel-price tracking application that allows users to locate the cheapest price in their area. Users are encouraged to submit images of price boards outside of petrol stations from which the price will automatically be extracted, stored, and displayed to other users.

37. Matthew Russell c20336046@mytudublin.ie

GreenPath: Eco-Friendly Form Submissions

This project sets out to create a sustainable centralised form submission system for workplaces. This system will replace paper-based processes and encourage the streamlining and simplification of workflows in order to create a better experience for management and staff. It will enable a measurable and manageable digital workspace that coincides with an already instituted government policy. Moreover

this will encourage an auditable and responsible work environment that takes advantage of the movement to hybrid work environments in the future.

38. Mihai Alexandru Samson C1956403@mytudublin.ie

Anti-bullying and obscenity chat filtering

The project idea is to create a chat filtering system using machine learning to help monitor online chatting services to reduce bullying and obscenities said in online chatting services. The online chatting service I reference is called Discord. The implementation offers to its users a chat filtering system to reduce bullying and obscenities said in their community. The way it operates is through a BOT user inside a Discord server. The bot can read the messages the users send and process the messages before they get sent in the chat.

39. Milosz Lewandowski C20355901@mytudublin.ie

Smart Fridge

Smart Fridge is a sophisticated web application created to combat the on-going issue of food waste while seamlessly integrating sustainability into everyday life. The application offers a intuitive user friendly interface that simplifies food management with ease. Users can effortlessly create customisable storage units tailored to their needs, ensuring optimal organisation and minimal waste with recipe suggestions based on available items and items expiring soon. Say goodbye to meal planning stress and hello to inspired cooking adventures!

40. Mykolas Kubilius C20321456@mytudublin.ie

Bilateral integration in virtual reality

The project's main goal and objective is to develop a simple level-based game that contains a different set of bilateral integration exercises that is currently being used in the real world. Using these examples, the game will contain a safe and fun virtual environment where the user with coordination difficulties can easily pick up a VR headset and pick up the controls then they can dive straight into the levels and test out how well their brains can coordinate together as there is a left side and right side of the brain. These exercises can range from holding a broomstick or a long stick with both controllers using the grip VR feature and having a light balloon-like 3D object bounce up in the air every time the user uses the stick to push the object upwards. Other exercises can involve using both hands to hold a virtual marker and draw something on a whiteboard or using one hand to draw the infinity symbol over and over again until they keep their marker inside of the line.

41. Ogulcan Sarioglu d20123805@mytudublin.ie

Storymaker: Using Generative AI to Create Streamlined MultiModal Reading Experiences

My project aims to create a multi-modal representation of any given text, enhancing it with images, voiceovers, and providing online interactive experiences with context-aware characters bots. It will give a holistic, scientifically backed multi-model interface to neurodivergent and neurotypical people alike to interact with the world the way they choose to, the way they like anywhere on any device. It will showcase the feasibility of low cost multi modal learning environments using the latest

advancements in Generative AI Models, and will kick-start a paradigm shift by automating otherwise highly costly image, audio and interactivity support for textual information and enable the systematic change for a more equal and inclusive learning styles.

42. Olabode Balinga C20478706@mytudublin.ie

Starlight Racers

Generic racing game, that users select a vehicle and race through 3 courses, while upgrading vehicle with buffs and powerUps along the way.

43. Oluwamayowa Adelaja C20376476@mytudublin.ie

NursePal

NursePal is a web application that provides functionality to help nurses in their day-to-day work on the wards. The main aim of NursePal is to improve the quality and efficiency of nurses' work by providing them with a web application where all the information they need to do their job is easily accessible at the tip of their fingers.

44. Orin McDonogh C20307673@mytudublin.ie

AutoTradeAI

An Automatic Crypto Trading Web App Using AI and Machine Learning to predict and back-test strategies.

45. Quang Anh Nguyen d18129855@mytudublin.ie

Digital Health

A project leverages decentralized technologies such as blockchain and IPFS to allow medical files to be shared between health providers, patients and insurers to enhance interoperability but still assuring ownership and privacy of the data. With the support for DICOM, HL7v2 and wearable data along with in-app bot with the help of ChatGPT for general Q&A, the mobile app can improve the accessibility and ease out the delivery of these medical files.

46. Raghav Bansal D20123625@mytudublin.ie

SnapBin - Take a Snap, clean the Bin

This project is a mobile application built with Kotlin programming language and Android Studio. Users can register and create accounts using their desired Email and Password which should be valid, the user details will be stored in the Firebase database and are authorized using firebase's own authentication feature.

This application is called Snapbin, Idea behind this title is "Take a snap, clean the Bin".

User can take the photos of garbage or bin, or any kind of waste which they want to report, User can add more images, and retake the image, if not liked or clear. If approved, it will take user to next screen which is detail screen, which take coordinates and details including date and time and description box and asking for urgency and in the next page, it will ask for what kind of waste it is, with the different options, after completing everything, That report will be sent to Dublin city council and they will be reported about the garbage that hasn't been cleaned and should be clean.

47. Roman Holub Ploshko C20390201@mytudublin.ie

Moodway

Moodway is an innovative web app that aims to enhance the athletic experience for cyclists and runners by seamlessly synchronizing their music with the terrain of their chosen routes. Recognizing athletes' desire for motivation and enjoyment through music, Moodway crafts a dynamic sound experience by leveraging Spotify's extensive music library to analyze and classify the user's music based on moods. It then generates personalized playlists where each track's mood corresponds to the elevation changes along the route, accommodating steep descents, hilly ascents, and flat roads.

48. Ron Trevor Liquit C20495892@mytudublin.ie

IBS tracker

A platform for users to manage their IBS symptoms by having useful features such as Text detection for foods that may cause symptoms. Diary logging, news site.

49. Ronan Singpurwala C20391216@mytudublin.ie

SaleSights

Micro firms constitute around 93% of all non-financial companies highlighting its importance in the business landscape. Despite their significance, many of these smaller businesses face challenges integrating technology with their financial operations. SaleSights simplifies financial operations for these businesses. SaleSights is a financial management and POS platform tailored for micro firms, streamlining all financial operations all on one single application. From sale logging to expense tracking, receipt OCR, analytics and insights, product management, receipt generation and Biz - SaleSights' advanced data analysis assistant, gaining actionable insights is as easy as a conversation. Manage your business effortlessly with SaleSights.

50. Sabrina Boc C20394813@mytudublin.ie

Eco-TravelPrint

A map navigation app that calculated the approximate CO2 emissions of a journey.

51. Saima Rafique C19473194@mytudublin.ie

FeedbackCraft

FeedbackCraft is a webapp platform that makes giving and receiving feedback easier. It helps users improve themselves personally and professionally by providing personalized insights and tools to track progress and set goals. It encourages a culture of continuous learning and development.

52. Sara Egan C20353056@mytudublin.ie

Culture Bridge

Culture Bridge is a web app that aims to help students in TU Dublin with the Erasmus research process. It will simplify the decision-making process by consolidating a wealth of information into a single, user-friendly platform. It consists of 13 European cities that are on offer for Erasmus. Each city contains information on the university

courses, university events, art, music, live events and reviews from past Erasmus students. This information is compiled through APIs and several web scrapers I developed. The highlight of the app is the recommender system, which allows the students to select from "interest bubbles" to determine which Erasmus cities best match their unique interests.

53. Seán Breen C20424096@mytudublin.ie

Nitelight

Nitelight is a nightlife safety companion dedicated to helping users feel safer in nightlife environments. It does this through its Bluetooth low energy powered friend finding feature that simply put makes "finding people faster".

54. Seán Devilly C20465804@mytudublin.ie

HomeScope: Insights of a property's local area

Integrates publicly available data into a property listing platform to provide comprehensive details about properties. Information about nearby schools, Garda stations, hospitals, as well as flood risk and broadband connectivity are included.

55. Stephen Moore D21125383@mytudublin.ie

C.O.R.H (Centre Of Recycling Help)

C.O.R.H.'s main focus is on creating an accessible mobile app for all users that encourages people looking to recycle and shows them where they can go to do so. The system shows where the recycling locations to recycle the material of your choice are and routes the most efficient path when a location is chosen.

56. Stephen Mester C20483376@mytudublin.ie

Co-Design Toolkit for people with intellectual disabilities

A tool to facilitate co-design between designers and people with intellectual disabilities, allowing designer and co-designer to wireframe a basic mobile application wireframe.

57. Twila Habab C20361521@mytudublin.ie

beCared Med Application

A medical web application where users can search for medicines and be kept up to date with the PIL and SPC. Users can also search for drug-drug or drug-food interactions and additionally chemical compounds.

58. Victor Zubatyy D21125389@mytudublin.ie

Mentjour.

mentjour. focuses on correlating mental health and fitness using journaling and health data.

59. Wen Ting Song C20325896@mytudublin.ie

AI Illustrator

This project aims to make reading more fun and exciting by creating a web application that can illustrate stories for the user, it can also generate stories with accompanying illustrations.

60. Group Project: Phone app being developed for the Men's Health Forum in Ireland

We are a team of six students currently enrolled in the Global Innovations Internship, where we are working on developing a mobile application for the Men's Health Forum in Ireland. The function of the app is to bring the material of the Men's Health Forum to a younger audience through a mobile app.

61. Group Project: AthruTech

Our team is developing an encyclopaedic app in cooperation with Food Safety Authority of Ireland to help food manufacturers and retailers reformulate their foods to reduce certain nutrients.