1 (Penwern Ltd) AI Assisted Creation of Rich, Interlinked and Consistent Structured Descriptive Metadata

Proposal Text

Our Organisation

Penwern Limited (**www.penwern.co.uk**) is a micro-enterprise specialising in consulting, software development, and technical services for the digital cultural heritage sector. We provide knowledge, guidance, tools, and services to galleries, libraries, archives, and museums (GLAMs) to boost engagement with the shared cultural record. Our vision for this project is to enhance our Curate software platform by incorporating AI-driven metadata generation and enrichment capabilities.

Challenge: Generating High-Quality Descriptive Metadata for Archival Records
Creating comprehensive, standardised descriptive metadata for archival records is a time-consuming and complex task. Archivists often struggle to capture the full context and relationships between items, potentially missing valuable connections that could enrich the overall description and discoverability of the collection.

Solution
We propose developing an AI-powered backend system for our Curate platform that will generate high-quality descriptive metadata for archival records, leveraging insights from related items within the collection. This system will be exposed through an API, allowing for flexible integration with various front-end applications.

The core aims of the proposed solution are to:

1. Ingest Collection Data: Process and analyse various forms of archival records, including existing metadata, full-text content, and associated digital assets.
2. Contextual Analysis: Utilise advanced Natural Language Processing (NLP) and Machine Learning (ML) techniques to understand the content and context of each item within the broader collection.
3. Relationship Mapping: Identify and map relationships between items based on their content, metadata, and contextual information.
4. Metadata Generation: Automatically generate descriptive metadata for an input item, incorporating insights from related materials to provide richer context.
5. Standardization and Compliance: Ensure generated metadata adheres and is located according to to relevant, standardised schemas (such as ISAD(G) **https://www.ica.org/resource/isadg-general-international-standard-archival-description-second-edition/**).
6. API: Create an API that allows tools and interfaces to interact with the metadata generation system.

Scope
This project will focus on developing a backend system for intelligent metadata generation and enrichment. Key components include:

- Developing algorithms for contextual analysis and relationship mapping across diverse archival materials
- Creating a metadata generation engine that produces high-quality, standards-compliant descriptions
- Designing and implementing a flexible API for interacting with the system

The primary deliverable will be a functional system accessible via an API.

Potential Extensions

While the core project focuses on backend development, several potential extensions could enhance its utility:

1. Metadata Review Interface: A front-end tool for archivists to review, edit, and approve AI-generated metadata suggestions.
2. Relationship Visualization: A graphical interface for exploring connections between items in the collection.
3. Integration with External Knowledge Bases: Expand the system's knowledge by incorporating information from authoritative external sources whilst determining the likely trust that should be assigned to the external source and allowing review of this information by the archivist.

Collaboration and Data Sources

We propose collaborating with Bristol Special Collections to access a diverse range of high-quality archival records for development and testing. This partnership will ensure that the metadata generation system produces relevant and valuable results for archival institutions.

Intellectual Property

Penwern will retain control of the intellectual property for the outputs of this project, as the enhanced metadata generation capabilities could be adapted into our platform in the future.

Information for students to help choose projects

A well defined project with plenty scope for increasing the challenge. A good pick if your team is interested in AI and machine learning along with API development.

Why do you want to work with students?

To bolster our skills with communicating a project vision with external development teams, to build our experience with onboarding and guiding new resources to reach productivity efficiently, and to build bridges with talented developers that we can offer projects to in the future.

2 (University of Bristol) Husbandry Checker and Triage App for Exotic Pets

Proposal Text

Exotic pets are becoming more popular among pet owners and even though there is abundant information online about how to take care of them, this information is often conflicting and not supported by scientific research. Inadequate husbandry can commonly result in health conditions for these animals, with some of these conditions becoming life-threatening. On the other hand, signs of illness in exotic pets can be subtle for pet owners, thus leading to many animals presenting to a veterinary practice once their health is severely compromised, often resulting in death or reduced life-expectancy for these animals. This app would have two main components:

1. Husbandry checker: pet owners would be able to select the species that they have and add specific information about the current diet, housing, enrichment and health monitoring provided for their animal. Based on literature and advice from exotics veterinarians, the app would provide information on ideal husbandry. This would aim at preventing diseases related to the captive care of these exotic

species.

2. Triage: pet owners would have access to a survey or interactive flow-chart to decide on the best course of action for their animal if they have any health concerns. This flow-chart would be designed by exotics veterinarians and aim at improving the timely presentation of these animals to emergency centres, before it is 'too late'.

Information for students to help choose projects

We think this is an interesting topic area, but the project will require further defining through interaction with the clients, in particular around suitable data format etc.

Why do you want to work with students?

I hope this project can be a good learning opportunity for students, as well as an enriching experience where they can collaborate with professionals from the field of veterinary medicine. The world of veterinary medicine is moving towards the development of digital technologies and the collaboration of professionals with different areas of expertise will become more and more common.

3 (Tee Martin Ltd) Using AI for Early detection of cancer

Proposal Text

> AI FOR EARLY CANCER DETECTION AND PROGNOSIS
>
> Qi-CT

Introduction: Our cancer diagnosis software represents a groundbreaking leap in the field of oncology, utilizing advanced technologies to revolutionise the detection and classification of various cancers.

Team: Michael Adeleye (Bristol University Innovation).

Problem: Late Cancer diagnosis and Late treatment due to cancer waiting time delays. Nearly half of all cancers in England are diagnosed at an advanced stage, when the chances of survival are reduced, and treatment is more expensive.

Solution: Patients can report early symptoms using the Qi-CT Web-based Assessment Platform.

- An assessment report will be generated using an AI Model, peer-reviewed by a telehealth professional in less than 48 hours, with instructions on what to do next.
- Having GPs and doctors as stakeholder(important) (Qi-CT will be embedded with current Enterprise software- doctors diagnosis tools can be used anywhere in the world)
- The platform can be globally used across Europe, North America, Africa, Asia etc. A healthcare system with an ethnically diverse dataset.
- Qi-CT can help doctors to recommend specific radiotherapy treatments and chemotherapy treatments.
- Qi-CT can expedite a consultation appointment booking system and bookings for tests at government and private clinics.
- Qi-CT can create Gut Health guidance i.e. (Nutrition Plans) and offer Alternative Lifestyle Guidance i.e. (Exercises Plans) for all users.

Benefits:

- Enhanced Accuracy: Reduces false positives and negatives, minimizing the risk of misdiagnosis.
- Time-Efficiency: Accelerates the diagnostic process, allowing for prompt treatment initiation.
- Cost Savings: Optimises resource utilisation by minimising unnecessary follow-up tests through accurate initial diagnostics.
- Reduces overcrowding at hospitals by providing a medium to report symptoms remotely.

Competitors: Thrive Early Detection, Freenome, Guardant Health and Exact Sciences

Information for students to help choose projects

This is a returning client. There's plenty of academic work in this area to build upon and there's excellent potential impact.

Why do you want to work with students?

Working with students brings me different perspectives and Indepth understanding and wisdom.

4 (Defra) Interactive Technology Radar

Proposal Text

The build of an online technology radar that we have been prototyping something we like, but not got much further than that, an example is here **https://white-smoke-0ab4eba03.4.azurestaticapps.net/** with the source code in git which we can share. However, you may notice a similarity with one produced by DHL!

We would like to have this in a way that we could update easily each quarter the changes we want to make to the radar and also be able to easily edit and create additional pages, all this would obviously need to version and source controlled.

We do have cloud environments that would host the final design.

A possibly alternative/stretch for this one could be putting this into virtual reality and making it a more immersive 3d experience for users. So being able to walk around the radar, click links and launch virtual experiences and information.

Further details:
The Technology Innovation team produces an annual Defra group Emerging Technologies Radar, with quarterly updates. This is to raise awareness of the key trends and identify the emerging digital technologies that in our analysis have the biggest potential impact and will provide the greatest business opportunities for innovating across the Defra group. This unique radar identifies the maturity and the potential size of the impact for each of the selected technologies, enabling informed business decisions on technology innovation investment.

The radar diagram shows in a single simple view the top 50 digital technologies of most importance to Defra group. The technologies are placed into four segments illustrating the technologies maturity from embryonic through to mainstream. The rings of the radar demonstrate the potential impact of the technology on the Defra group from moderate to transformational, the closer to the centre, the more potentially transformational the technology. Finally, this report explains why the specific technologies on the radar are important to Defra group, mapping what they can potentially be used for to meet Defra group's business

challenges and the outcomes it has targeted. The radar is therefore aimed at all those across the Defra group who have an interest in emerging digital technology."

The current report is a PDF report (https://uob.sharepoint.com/teams/grp-ILOStudentProjects/Shared%20Documents/Forms/AllItems.aspx?id=%2Fteams%2Fgrp%2DILOStudentProjects%2FShared%20Documents%2FGeneral%2FComputer%20Science%2FClient%20project%20proposals%202024%2FDefra%20radar&viewid=0e16327b%2D6b79%2D4f61%2Da744%2D6d1d40dcd61d), this has transformed from being a word document, to more of a glossy brochure to make it more appealing. The next stage for us (you 😊) would be to transform this into an interactive radar so that potential business areas could filter based on what they want to achieve i.e. automation, sustainability etc, and then those technologies identified can support that initiative will be displayed, clicking the links will provide a short summary with a follow on page with a more detailed summary of what, how and examples either from other people or from our own work.

Information for students to help choose projects

A good project if your team is interested in developing a visual app, with plenty of scope for expanding the brief (into VR)

Why do you want to work with students?

Sounds like a nice little project that we don't really have the time or expertise to complete as never a priority so really a nice to have. We have worked with you before and was very successful.

5 (Defra) Personalised Development Training tool

Proposal Text

The building a personalised development training plan tool, which could be used to support the training needs of one of our training departments to support their staff.

Potentially using an underlying LLM with additional system prompts, pre-built prompts and retrieval augmented generation to essentially create an LLM specifically for training (potentially for new vets). It could tell vets which training they need to do (including mandatory training) and even build them a career path (based on defined career development pathways), ideally you could even load into it results from personality traits tests such as myer briggs, leadership surveys, etc so it could generate personal development as well as professional development needs.

Information for students to help choose projects

This project will require further definition through talking to the client, however this means your team would have a great chance of shaping the project to your own interests. Especially good project if you want to work with LLM chatbots.

Why do you want to work with students?

A great opportunity to work with an emerging technology to prototype ideas and show the art of the possible.

6 (IBM) VR AI Learning tool

Proposal Text

Create an adventure game, that allows the user to explore a major tourist destination (such as Venice) using VR.

Here the player is encouraged to learn a new language – by asking directions to famous locations, booking a hotel room and ordering a meal.

Utilise VR (Unity) to create an immersive world that the user can explore – and lead the user through milestones on their journey.

Provide the means for the user to learn and repeat a target language in real situations for example:

- Moving through customs at the airport
- Catching public transport
- Ordering a meal
- Booking a hotel

Utilise IBM Watson Speech to Text and Text to Speech so the user can interact with the game
Utilise IBM Watson Assistant to provide the framework for the conversations between the player and NPC's

A VR based game that uses IBM Watson to create an immersive language learning game

Information for students to help choose projects

Perfect for a team that would like to use Unity and specialise in VR and game development. We've had IBM projects for a number of years now, and are a safe pair of hands, but from experience your team may be required to make more design decisions without client input.

Why do you want to work with students?

Great past experiences working on projects with students at the University of Bristol

7 (IBM) AI Travel

Proposal Text

Develop an AI incorporated platform designed to allow users to interact with each other around the area of recreational travel. This tool will enable users to share their own travel experiences, connect with others with similar interests, as well as receive personalised travel recommendations based on their profiles and preferences.

Expected outcomes/deliverables:

- Research findings on similar existing platforms with discussions of their features as well as possible improvements
- A design specification for a software application.
- A new algorithm developed using AI technology.
- A fully documented and functional piece of software.
- A strategy for testing and evaluating the software.

Technical challenges

- Develop a customisable control panel which will contain users travel profile and act as a central dashboard from which users can access other features of the platform
- Add additional features to the application to extend functionality, for example, allowing users to create their own itineraries, connect with other users and share media
- Incorporate / Integrate AI into app to make the platform more personalised (develop algorithm to make travel suggestions to users based on their profiles)
- Embed IBM Watson AI into app to develop an interactive chatbot that will help users navigate the platform

Information for students to help choose projects

Perfect for a team that would like to develop a platform based around AI. We've had IBM projects for a number of years now, and are a safe pair of hands, but from experience your team may be required to make more design decisions without client input.

Why do you want to work with students?

Great past experiences working on projects with students at the University of Bristol

8 (IBM) AI for the elderly

Proposal Text

Problem to be solved.
As the pace of technologically enabled social engagement grows, the the elderly become more and more left behind despite the consumability and the capability of the technology. This results in increasing isolation, loneliness and ill health. We need a 'Social Pet' that encourages the user to engage whilst keeping them connected to the outside world.
Create a mobile phone based 'pet' that responds to being spoken to, and interacted with. The more the user interacts with the pet, the 'happier' the pet becomes. The aim is to create an emotional bond between the user and the assisted living device

This pet should also serve a number of practical purposes as well as providing a form of companionship.

1. Note the users typical schedule – if the user steps out of this schedule (eg. They usually are down for breakfast by 8am and for some reason they have not been detected) then call out to the user. If the user has heard no response (perhaps the user has fallen) then contact a carer or family member by text.
2. Pet should ask the user to tell them about their day, and encourage them to plan out what they intend to do.
3. Pet should also ask the user what they like (music, sport, film, radio, hobbies) and search for podcasts around these topics, and suggest them to the user. Offer to play them at a set time during the day
4. Pet should allow family members to mobile text and tweet to the Pet, and the Pet should then read the texts to the user. Pet should also allow the user to respond via voice, convert to text and send that via mobile text message or Twitter to the original sender.
5. Pet should initiate the user engagement, by making a noise in the morning – indicating that the pet wants to be interacted with and this will be used as a way of commending interaction with the users.

6. Pet should not move around the house, but is should be animated and it should be able to display emotions both audibly and visually (sadness when neglected, happiness when interacted with)

Perhaps for inspiration see Twitch, particularly movement and response to touch: **http://www.instructables.com/id/Twitch-Your-Robotic-Pet/**
Although given current restrictions on movement, it may be simpler to consider creating a 'virtual pet' that runs as an app on a tablet.

The user should be able to interact with the Pet using Watson assistant and Speech to Text and Text to Speech

Information for students to help choose projects

A novel application area around digital companionship that we feel has plenty of room for expanding the challenge. Be warned that ethical clearance for running studies with the elderly is non-trivial. We've had IBM projects for a number of years now, and are a safe pair of hands, but from experience your team may be required to make more design decisions without client input.

Why do you want to work with students?

Great past experiences working on projects with students at the University of Bristol

9 (Pension Pal) AI Generated Meeting Minutes

Proposal Text

Organisation background
Our firm (PensionPal Limited) develops online and app-based governance solutions for Pension Scheme Trustee boards and for Corporate Boards using Microsoft Azure's cloud-based infrastructure.

Our software includes an Electronic Meetings Module that enables the secretariat to create and distribute meeting packs to board members electronically.

Project background
We would like the student to explore the use of AI to generate draft meeting minutes from audio extracts taken from meetings. The structure of the minutes will be based on an online meeting agenda that is already available on our governance platform.

For each agenda item the minutes will capture:

- a summary of the key points discussed (and key contributors)
- actions arising from the discussion (along with action owners and action due dates)
- decisions made

We use Microsoft Azure's cloud-based infrastructure for our online solutions, so the starting point will be to explore whether Microsoft Azure provides components that can be utilised as part of the project (e.g. Microsoft Azure's AI "Speech to Text").

Project objectives

- Proof of concept / feasibility study (including costs)
- Prototype development

- Understand any legal considerations (e.g. data security and privacy, professionalism and ethics – note that we will provide guidance)

The minutes maker tool will be integrated with our existing online governance solutions. Some of the challenges will be:

- to capture the formal nature of “Board Meeting” minutes in a suitable style
- to develop a set of user friendly tools that would allow human interaction to “convert draft minutes” created by the AI into “final minutes”, e.g.
- editing features (with links to the original transcript / recording)
- features to ensure that actions discussed in the meeting are captured by the AI, recorded accurately in the minutes and entered into our online action tracker feature
- features to ensure that “conflicts of interests” declared at meetings are recorded accurately and entered into our online conflicts of interest register
- to produce online links to documents referred to in meeting discussions

Stretch goals:

- answering questions within the meeting based on information obtained from documentation held in our central document library (or more widely)
- presenting information that could be confirmed in the meeting (e.g. actions captured could be presented in real time to be confirmed as accurate during the meeting)

The main value for us will be creating a draft set of meeting minutes from a voice recording of a meeting (and allowing human interaction to fine tune) and extracting actions. A dashboard or web-platform would be useful in the sense that it will include a database for storing details and it will provide ideas on the interface – our software already has an “action tracker” feature but seeing a web-platform developed independently could be helpful.

We will be able to provide example meeting minutes/recordings and would be happy for the students to do user surveys with people in our organisation .

Throughout the project the student will be provided with access to a senior developer who will be able to provide guidance.

Information for students to help choose projects

A well defined problem, with a lot of choice available to your team on technology choice. We feel like you would need to speak to the clients to help firm up the novelty of the project and to differentiate it from other competing technologies.

Why do you want to work with students?

(blank)

10 (SoloBudd Ltd) Alternative App Development + UI: SoloBudd

Proposal Text

Project: SoloBudd- Traveler Connection App

Project Overview: SoloBudd is an innovative mobile application designed to enhance the solo travel experience by addressing issues of loneliness, isolation, and safety. The app will connect solo travelers based on interests, location, and itineraries, fostering a global community of adventurers.

Key Features:

Interactive Map: Real-time geolocation of nearby users

Communication Features: Private chat and group chat

User Profiles

Events Management: Join, create, and set up new events

Bookmarking: Save and share favorite locations

Itinerary Planning: Create travel itineraries

Technical Architecture:

Frontend: Flutter/Dart for cross-platform mobile development

Backend: Node.js with Express.js framework

Database: Google Cloud Firestore for real-time data synchronization

Machine Learning: TensorFlow for recommendation algorithms

Cloud Infrastructure: Google Cloud Platform for scalable and reliable hosting

Firebase integration for authentication, real-time database, and cloud functions

Development Challenges:

Creating an intuitive, user-friendly interface for the target demographic (18-35)

Implementing multi-language support

Developing offline functionality for areas with limited internet access

Ensuring robust safety features and user privacy

Designing and implementing data science-driven matching algorithms

Integrating AI capabilities for chat support, travel recommendations, and journaling

Optimizing app performance and scalability

UI/UX Design Focus:

Clean, modern, and intuitive interface design

Emphasis on user safety and privacy

Seamless onboarding process

Customizable user profiles

Easy-to-use event creation and management tools

Interactive map interface with clear location markers

Accessible chat and communication features

Intuitive itinerary planning and sharing functionality

Consistent design language across all app features

Data Science Opportunities?:

Develop matching algorithms based on user preferences and behavior

Analyze user engagement patterns to optimize features

Benefits for Students:
Hands-on experience with cutting-edge technologies (Flutter, Google Cloud, Firebase, AI/ML)
Opportunity to work on a real-world application with social impact
Exposure to full development cycle from UI/UX to backend implementation
Potential for publication or conference presentations
Possible internship or job opportunities post-graduation

Project Phases:
Requirements gathering and analysis
UI/UX design
Frontend development using Flutter
Backend development with Node.js and Google Cloud Platform
Database design and implementation with Firestore
Integration of Firebase services
Development of matching algorithms?
Testing and quality assurance
Deployment and launch
Post-launch monitoring and optimization

Expected Outcomes:
A fully functional MVP of app
Documentation of the development process and technical architecture
Research findings on user behavior and engagement patterns
Presentation of the project at university symposiums or tech conferences
Potential for further development and commercialization of the app

Information for students to help choose projects

This is your chance to develop a fully fledged full stack web application that has a lot of features to implement, and a lot of scope for increasing the challenge once the basic features have been implemented.

Why do you want to work with students?

I'm deeply passionate about working with students on this project because I've experienced firsthand the incredible value of such collaborations. Back in 2021, I had the opportunity to work on a project for Gousto, where we significantly improved their data science algorithm accuracy. This experience was not only rewarding for me but also provided invaluable real-world experience.

As someone who has benefited from similar opportunities, I want to give back and create a win-win situation for both the students and our startup. By involving students in SoloBudd, they'll gain hands-on experience with cutting-edge technologies like Flutter, Google Cloud, and AI/ML, while also learning about entrepreneurship as a viable career path. Moreover, as our target demographic, these students will bring fresh perspectives and insights that could be crucial to our app's success. I believe this collaboration will not only enhance their learning but also contribute significantly to the development of an innovative solution for solo travelers worldwide. Indeed, as we scale up - due to university contribution, they would be high up on the list of placements - internships and similar based on merit and equal opportunities of course. Indeed, we would recognise the University in general.

11 (Legal-Pythia LLP) FinTech Data Analysis Platform

Proposal Text

At Legal-Pythia, we're committed to transforming how FinTechs in India and the UK manage and analyze complex datasets. As the financial sector rapidly evolves, it's essential for institutions to leverage technology to ensure compliance and reduce risks. We're excited to propose a collaborative project to develop a user-friendly data analysis platform specifically designed for the FinTech industry.

Our organization specializes in innovative solutions powered by Explainable AI, helping clients navigate legal and regulatory complexities. We aim to create a platform that incorporates machine learning algorithms to analyze financial datasets. Key objectives include designing a scalable software architecture, implementing algorithms for detecting data duplications and assessing compliance risks, and creating an intuitive interface for users. Security will also be a top priority, ensuring that sensitive data is protected.

To support this project, we will provide students with a synthetic dataset that includes anonymized financial transactions and customer data, reflecting real-world scenarios faced by FinTechs. This dataset will be hosted securely online, along with documentation to help students effectively utilize it.

The primary deliverable will be a fully functional software application with a user-friendly interface, along with comprehensive documentation detailing the architecture and development process. We also envision incorporating data visualization tools that present insights clearly, helping users make informed decisions. At the end of the project, students will present their findings and the application's capabilities.

Our project will require some specific software and tools to develop the data analysis platform effectively. Students will need access to an Integrated Development Environment (IDE) like Visual Studio Code or PyCharm for coding, along with proficiency in Python for backend development and JavaScript, HTML, and CSS for the frontend. Familiarity with machine learning libraries like TensorFlow or Scikit-learn will be important, as well as using Pandas and NumPy for data manipulation. We'll also need a relational database management system, such as PostgreSQL or MySQL, to manage the datasets, and data visualization libraries like Matplotlib or Plotly to create visual insights. While version control with Git and platforms like GitHub will be essential for collaboration, we'll strive to identify free or open-source alternatives for any software that might have associated costs since we know the University of Bristol can't provide funding for those. We're here to help students navigate these requirements and find suitable solutions along the way!

This project offers students a fantastic opportunity to gain hands-on experience in software engineering while addressing real-world challenges in the FinTech sector. They will develop valuable skills in teamwork, project management, and communication, all essential for their future careers.

In summary, this Software Engineering project aims to build a data analysis platform that empowers FinTechs in managing their data more effectively. We believe this collaboration will be mutually beneficial, allowing students to gain experience while we harness their creativity and technical skills. We're excited about the potential of this project and look forward to working together to drive innovation in the FinTech industry.

Information for students to help choose projects

An excellent choice if your team wants a solid fintech project, this client has worked with us on few different projects in past years.

Why do you want to work with students?

We're genuinely eager to collaborate with students on this project because their fresh perspectives and enthusiasm can bring new energy to our work at Legal-Pythia. By partnering with students, we can benefit from their creativity and technical skills, which are crucial for developing innovative solutions to the challenges faced in the FinTech sector. This collaboration not only offers students valuable hands-on experience and a glimpse into real-world industry practices but also allows us to stay connected to emerging ideas and trends. We believe that this partnership fosters a collaborative spirit where everyone can learn from one another, ultimately driving impactful results that advance our mission and contribute to the students' growth as future professionals.

12 (Virtual Hospitals Africa) Virtual Hospitals

Proposal Text

> Virtual Hospitals Africa Doctor Application Collaboration

Introduction

Virtual Hospitals Africa (HGAT) is a healthcare trust based in Africa. Our primary goal is to achieve health systems strengthening for rural and underserved communities. As such we have embarked on an initiative to build a Virtual Hospital that will make it possible for remote and underserved communities to access doctors and specialists from around the world.

The Virtual Hospital Platform

This is a software platform that will consist of the following five main components:

- Doctor Application
- Whatsapp Chatbots for Patient and Service Providers
- Caregiver Application
- Nurse Application.
- Electronic Health Record

There will be other supporting modules to complete the Virtual Hospital. The platform will be hosted on Amazon Web Services with the Meta Business platform providing the Whatsapp Chatbot technology.

The Doctor Application

This collaboration will focus on the Doctor Application. The Doctor Application is an application that will be run on a doctor's device including phones, tablets and laptops. These doctors will be stationed anywhere in the world where there is good internet access. Their main functions will be to:

- Receive incoming appointments
- Confirm, Reject, or Reschedule Appointments
- Receive and review remote patient data from nurses and come up with a Treatment Plan
- Connect with patients through Video, Chat and Voice for Medical Consultations
- Generate prescriptions and other orders for patients, nurses, pharmacists, pathology labs, x ray operators, specialists and other service providers.
- Refer patients for further care

Doctor Application Components

The application will consist of the following components:

- Registration
    - SSO/Welcome
    - Home page (Appointments and Reviews)
    - Calendar (Availability)
    - Notifications
    - Patient Profile
    - Connect (Video and Voice to Patient Whatsapp.)
    - Treatment Plan and Orders
- Patient Information Feed
    - My Supporting Staff
    - My Profile

Depending on the size of the team, the team can choose to do the whole application or a number of components. For example, a team may opt to work on Single Sign On (SSO), Registration ,and Homepage.

Available Resources

- Heroku platform access
- Notion platform access and prepared user stories
- Completed Figma wireframes
- Github Repository Account
- Slack Workspace

Tech Stack and Skills Requirements

- Fresh
- React JS
- React Native
- Typescript
- PostgreSQL
- Whatsapp Cloud API
- Google Calendar API
- Redis
- Tailwind

These application will be a Progressive Web Application
Participants will not be required to have a background on all programming languages and tech stack as they will work as a team and may choose to work on limited components.
HGAT will be on standby to cover any skills gap that may arise for any reason.
Collaboration with the existing Virtual Hospital team will occasionally be necessary depending on the direction of the project.
Periodical online meetings will be needed as per participants' convenience.
All work will be virtual.

Contact: jonathan.tagarisa@virtualhospitalsafrica.org

Website: https://www.virtualhospitalsafrica.org/

Information for students to help choose projects

A solid web development choice. You'll be building on work by students in previous years (this will be the project's third year). A project with great potential impact.

Why do you want to work with students?

Great past experiences working on projects with students at the University of Bristol.

13 (Ferryx) Development of a gut health monitoring app

Proposal Text

1 in 5 people in the UK are affected by irritable bowel syndrome (IBS). A lack of treatment options forces people to live with symptoms that are worsened by stress and impact lifestyle and mental wellbeing. Despite their popularity, probiotics don't work during a flare up or when someone is stressed.

Ferryx's lead product, Ferrocalm, is the first next generation probiotic that functions during a flare up or stress, when people need it the most.
Ferrocalm is currently sold direct to consumers via our website (https://ferrocalm.com/) and, as a new product we are continually seeking feedback from our customers to build up further evidence for the efficacy of this product in alleviating IBS symptoms. Specifically, we invite our customers to take part in an 8-week trial. In this instance, customers buy two packs of Ferrocalm and are sent short surveys to complete before they start to take the product and then at two-week intervals thereafter up to eight weeks. When all surveys have been completed, customers are rewarded with either a free pack of Ferrocalm or a £20 Amazon voucher.

Customer surveys are currently sent out via MailChimp. This can be a clunky system which doesn't provide the best user experience. For example, we don't have the option to send reminders, so customers often miss surveys. As a result of this poor user experience, only 60% of people who start the trial complete it. This means that we are losing important data to an inefficient system.

Our surveys ask customers to score individual symptoms from 0-10 and then, at the end, they are asked to say whether overall, they feel their condition has improved, stayed the same, or worsened. An additional problem of the MailChimp surveys is that our customers cannot see their previous responses which often leads to inaccurate data. For example, after 8 weeks, we often see overall symptom scores significantly reducing, but the individual doesn't necessarily remember this so may say their condition hasn't changed.

We would like to develop an app via which we could deliver these surveys to improve user experience, improve compliance, and increase accuracy of data collected.
The key features of the app should be:

- Ability to complete surveys following purchase of an 8-week trial
- Push notifications when surveys are due/overdue
- Ability to track scores over time
- Easy data transfer to Ferryx team for data analysis (export in CSV form?)
- Individual user accounts
- GDPR-compliant

Whilst the surveys are the primary focus of this project, we would like to be able to build additional features into the app in the future. For example, we would like to include food and mood diaries to allow customers to track their symptoms relating to what they eat and how they feel. In addition, the app could link to our website where we post regular blog articles relating to gut health.

The aim of this project is to develop an MVP whereby we can test the hypothesis that app-based surveys would increase compliance and accuracy of data reported.

Information for students to help choose projects

A good chance to develop an app from scratch. We know that the client is open to ideas here, so there's a good chance for shaping the brief with your team's interests.

Why do you want to work with students?

We have previously engaged with students on a number of projects and have found it a great way to bring new knowledge skills into our business and conduct projects which would be otherwise unachievable due to budget constraints.

14 (Al Fateh Technologies Co L.L.C) Multilingual Virtual Tour Assistant for Local Navigation

Proposal Text

Project Description:
This project aims to create a multilingual virtual assistant app designed to assist tourists in navigating essential services and locations, such as nearby railway stations, cab stands, pharmacies, medical centers, and ATMs. Using GPS data, language translation services, and AI-based recommendations, the app provides real-time guidance tailored to each user's native language, making local exploration simpler for international travelers.

Key Features:

- Language Selection and Multilingual Support

  At the start, users select their preferred language. The app then provides directions, recommendations, and instructions in this language.
  Integration of language APIs (e.g. open-source alternatives) to support few languages initially.

- Location-Based Service Recommendations

  Use GPS to locate and display nearby essential services, such as transportation hubs (railway stations, bus stations, taxi stands), healthcare (pharmacies, hospitals), ATMs, and convenience stores.
  Provide real-time directions to these locations, with information on estimated arrival times.

- Local Information and Cultural Tips

  Display culturally relevant tips, like local customs, language phrases, or etiquette. This can help travelers understand the location and avoid common misunderstandings.
  Include important contact information for local embassies, tourist assistance hotlines, and emergency numbers.

- Augmented Reality (Optional)

For an advanced feature, integrate AR so users can point their phone at a location, and the app overlays essential information directly onto the screen. For instance, the app could visually guide users to a taxi stand or railway station.

- User-Friendly Design

  Simplify the app's interface so it's easy to use for people of all ages and backgrounds. This is particularly important for travelers who may be in an unfamiliar environment.
  Integrate accessibility features, such as text-to-speech for users with visual impairments.

Technical Components:

- Geolocation and Mapping: Use open-source mapping platforms like OpenStreetMap for reliable geolocation data.
- Translation API: Leverage a translation service to provide language support. For cost-effectiveness, consider integrating free language libraries or building a smaller subset of pre-translated texts.
- NLP (Optional): Implement basic NLP for understanding user questions, such as "Where's the nearest pharmacy?" or "How can I get a taxi?" to enhance the virtual assistant's interaction.
- Backend and Database: Use a cloud database to store essential location information, local phrases, and user settings. Firebase, MongoDB, or SQLite could be suitable for handling data and real-time requests.

Feasibility and Scope for College Project:
This project can be implemented in stages, starting with basic features and moving towards more complex ones, such as real-time language translation or AR. It combines essential software engineering skills (front-end, back-end, databases), provides hands-on experience with geolocation and NLP, and addresses a real-world problem, making it both practical and educational.

Information for students to help choose projects

This is a really clear brief with a well defined application area. As mentioned in the brief the project can easily be built upon in stages so would suit an ambitious team who's interested in developing using a number of different technologies.

Why do you want to work with students?

Al Fateh Technologies is a tech consultancy and our expertise lies in providing solutions to complex IT requirements. We design solutions based on the research done for a particular location or organisation and we know that students today have a lot of ideas. We would want to see how students take up this challenge of converting an idea into a working model.

15 (Jisc) Student dropout predictor

Proposal Text

Our Learning Analytics platform pulls data from Universities and calculates engagement metrics for every student and presents them to staff in a dashboard format. These metrics are based on VLE activity, attendance, and assignment submissions. We also know which students drop out. There are some details of it here: **https://www.jisc.ac.uk/learning-analytics**

The project is to use this information to predict the probability of subsequent students dropping out.

The key objectives are to analyse the data to classify each of the data metrics in terms of their relationship to the drop out probability. It is likely that this will be subtly different for each University. Secondly to create a machine learning algorithm and apply it to the data periodically to create a dropout index for each student.
Several algorithms can be developed in parallel to evaluate their accuracy and effectiveness

Information for students to help choose projects

A chance to work on a data heavy project with a clear impact. How it's implemented appears to be still open, and you'll have to work with the client on defining this. Would suit a team who would like to go deeper into machine learning and algoithms.

Why do you want to work with students?

To give students the opportunity of working on a real project

16 (Unusual TechnologiesLtd) AI designer

Proposal Text

An AI powered web tool to help a layperson plan and design a software project.

We are an SME creative software company in the UK that works with other industries who need our skill set to produce their ideas for improving processes, creating new products, marketing stunts or training and awareness raising. We are looking to lower the barrier to entry and help demystify the process to allow more people access to our services.

To realise our ambitions, we plan to leverage our skills in training software development to create a web-based project management tool with a major additional feature - a tool that helps new clients build a project plan, learn about terms, processes, requirements and costs and walks them from the very beginning to the very end of the project life cycle. This will make use of our understanding in both how to educate via tech and the common misconceptions clients from outside the industry have. It will use our vast amount of data on various projects, times and costs as well as designs and questions we ask clients to train an AI assistant that will help prompt the user.

Information for students to help choose projects

A software development project focused on the software development process - if you're enjoying the software engineering module and want to create a tool to enhance this, this project may be the one for you.

Why do you want to work with students?

Looking to explore and build relationships with students
Looking to give back in the form of mentoring

17 (Innovation Advantage Ltd) Photobioreactor SCADA Internet Platform

Proposal Text

Innovation Advantage Limited (IAL) is developing a new low-cost modular & scalable Photobioreactor (PBR) to culture microalgae and macroalgae (seaweed).

Significant R&D and scaleup investment is now happening worldwide to produce bioproducts in an environmentally sustainable way. Algae have the potential to produce materials and products in a circular economy and replace the equivalent fossil fuel sourced materials.
Growing algae requires constant monitoring of environmental conditions and control of inputs such as light, temperature, pH, nutrients, oxygen levels and CO2. One of the biggest challenges is scaling up successfully. What works in the laboratory does not always work at an industrial scale. Laboratory equipment is also expensive and not robust enough for industrial use. On an industrial scale, an affordable system is needed that provides supervisory control and data acquisition (SCADA) capability.

An additional goal of the photobioreactor design is that it utilises repurposed PET plastic bottles. The incorporation of these ubiquitous items that are still treated as ‘waste’ provides a key part of the low-cost design. Various configurations using soft drink bottles have been tested but constant manual monitoring of the photobioreactor is needed. The next step of the prototype development is an automated or semi-automated control system. The aim is to make this system scalable and affordable (using existing single board computers such as Arduino, Raspberry Pi with open-source data platform using CAN, MQTT or other protocols). Once a platform has been developed that can be monitored through a smartphone app, then standalone PBR units that use solar power can be left in remote locations with LPWAN to provide monitoring & maintenance support.

Ultimately plastic waste should be seen as a future resource and localised applications that repurpose and recycle it found so low- & middle-income countries can benefit from packaging material that has become the primary source of microplastic pollution worldwide.

Information for students to help choose projects

This project will involve both some light hardware development and networking, so make sure that your team is happy in engaging in both of these areas before choosing this one. We imagine this project will probably also involve some web development if the client is also after a dashboard for monitoring and control. This may potentially be a hard project to get the basics going, but with an excellent scope for advanced work, in an area that has real impact.

Why do you want to work with students?

I'd like to provide students with an opportunity to help develop a real-world control application for an exciting project that could help shape the future of environmentally sustainability world. This start-up project is driven very much by the software and control systems needed to monitor, detect and prevent collapses in a low-maintenance microalgae chemostat. Students with an interest in environmental engineering that would like to experience supporting an early Technology Readiness Level idea would enjoy the creativity and excitement that this project has to offer.

18 (IOTICS) Decentralised Data Sharing across a "Supply Chain"

Proposal Text

IOTICS' technology enables secure, selective data sharing within and across organisational boundaries. IOTICS' core product, IOTICSpace, is for engineers and enables them to support the establishment of a decentralised network of self-sovereign spaces in which the space owners set their own rules for sharing metadata and data. The data can be static, streaming, structured and unstructured.

IOTICS' latest product, Nyx, is for business users and/or engineers. It enables people to make their data ready for use by Generative AI (GenAI) and decentralised Retrieval Augmented Generation (RAG), including structured data, at significantly improved retrieval accuracy. It then supports their use of GenAI and RAG so that people can simply ask real-language questions of their data without reliance of data engineers or analysts. Uses include providing simpler access to data, such as CSV files, spreadsheets and streaming data, by a wider variety of teams for their own purposes. For example, a local authority might have air quality monitoring stations managed by its road traffic team which it routinely reports out within a spreadsheet so that it can track changes over time to monitor impacts of traffic management schemes. However other teams, such as in Public Health and Environmental Health, would also value access to that data to develop and quantify impacts of interventions in supporting better health outcomes for local residents and in green initiatives.

Using Nyx, rather than sending duplicate copies of data to people in different departments and teams, the data owner within traffic can simply make the data available selectively, by using the inbuilt access management tool, to other teams. This saves duplicating data and wasting energy by sending and storing data separately. The other teams also don't need to analyse entire data sets but instead ask questions of the data and receive answers based on data with veracity and known provenance.

There are many examples of this generic requirement across industries and sectors: prime companies in a supply chain wanting to query inventory across the supply chain to help plan production cycles; health practitioners needing information lodged within individual or cohort data owned by different teams within health and social care; incident managers tackling disaster response working with a cross-section of response services which hold vital location, availability and equipment status of the resources they have to contribute to rescue efforts.

With either or both of these tools at their disposal, IOTICS' challenges students to fulfil an industry use case in which data from across a supply chain, previously challenging to share owing to concerns such as IP protection, confidentiality, corporate sensitivities, or lack of technical support skills available, becomes easy for business users to interrogate without reliance on data engineers or analysts such that they can make considerably faster decisions with measurable outcomes and impact. Our product has an SDK, so the team could evolve the use case to create their own AI solution on top of the discoverable data. For example, we've been experimenting with this ourselves and have created means of automatically representing different hierarchies of views about school capacity (individual school; local authority, DfE); a tool for analysing survey responses including sentiment analysis; skills benchmarking with an ability to obscure sources through amalgamation such that individuals receive a percentile position without revealing anyone else's raw data to anyone else.

IOTICS can provide training on its tools.
IOTICS has no preference on the industry chosen as the focus of the project.

Information for students to help choose projects

This project will require the team to do some scoping with the client on what is achieveable in the project - however a good choice for teams interested in the applied use of AI

Why do you want to work with students?

IOTICS is prevalent within specific sectors at present, despite having tools with generic application of data challenges. IOTICS is keen to see the usefulness of its tools challenged by use cases outside of their usual application and tasked with solving problems that IOTICS' own team wouldn't necessarily think to describe as a typical application.
IOTICS is also aware that there is a significant shortage of data engineers with an understanding of the underlying challenges in enabling industry to use GenAI and RAG, so is keen to support a tranche of next-generation data engineers in developing an understanding of the importance of data provenance, veracity and in the ethical application of AI such that they can enable its productive use as they move forward into the workforce.

19 (Fishy Filaments) A remote systems training, maintenance and support System

Proposal Text

This project will be focussed on development of a language independent training tool - using a graphical interface to drive training for remote operations, from machine maintenance to environmental monitoring. This is something we've already started from the perspective of developing our site specific process documentation but can see upcoming challenges as we go international.

We're potentially looking at licensing or franchising out construction and operation of our containerised recycling plants so we have a potential global workforce of around 45,000, each with a local language challenge, but all using a similar set of hardware in a very similar way.

Most of them will have access to mobile phones at work, they will all have access to a fixed LCD panel that is part of the plant itself, and in some working cultures ownership of the skills are a tradable item in themselves, so we want to be realistic about how our company might impact the working lives in the communities our tech reaches. We want to make sure the workers are trained well and consistently, but be realistic about what we can ask in terms of documentary evidence.

Keeping a record of who is trained on what, and how each of those processes performs, is very much a live issue, especially in a manufacturing environment that is governed by ISO accreditation.

While this remote delivery of dynamic training and quality assurance is an end-goal its probably a bit much for a summer project, and we haven't yet built the full scale recycling plant to a final design, so as a starter for us to understand the challenge better we'd look at a single site AR/VR training tool with our current site in Cornwall as its focus.

So part if the idea is a cursor driven interrogation and drill down over a photo-realistic background - see an thing, click on the thing, get a few options regards documents or further details, take an option, etc
In this basic format, without sensitive training information, it could also be used as a marketing tool to allow website users to take a virtual tour.

Strongly aligned with the international remote training side of this challenge is a process support function - the data feedback from the plant productivity to help deliver ISO controlled processes.
But if possible we'd like remote sites to be able to populate the global database (above) with their own performance data

Information for students to help choose projects

A chance to work on a challenging problem of training people on the use of equipment without resorting to the use of language. We think this is an excellent project for a team who is willing to take a creative approach to interface design, for instance could gamification play a part in the solution to this problem?

Why do you want to work with students?

(blank)

20 (Bright Evolve) Ascent Sales Diagnostic - AI Integration

Proposal Text

In 2024, we launched an online sales diagnostic tool for early-stage businesses, called Ascent. The tool is intended to support Founders to create a tailored plan for sales, by assessing them against six pillars of growth.

We've had some early success, but we've realised there are limitations. The goal was to replicate 20+ years of B2B sales experience via this online tool, and before AI entered the mainstream we would've achieved that. But now we need to go even further, and consider the role AI could play in this tool.

The end goal is that users can access Ascent, answer a series of questions and then receive highly personalised, real-time support from an AI Agent which replicates the kind of support currently provided by a human.

As Ascent is created by the team at Bright Evolve, who aren't technical, we've reached our limitation on what can be achieved. Therefore, this project involves plotting a roadmap from A (our current solution) to B (a fully automated, AI-enabled solution). We'd like to understand viable options, the art of the possible, risks and potential costs.

We'd welcome innovative thinking which connects business thinking with technical know-how, as we're very open to ideas that we've not thought of.

Information for students to help choose projects

This project explores the use of AI on an existing product - this would be good for a team who are keen to explore the best and most effective use cases of AI for the business

Why do you want to work with students?

As the Founder of Bright Evolve, I've set this business up with the mission of enabling growth. That's obviously what we do with our clients, but I'm also keen to support the local economy and academic scene.

21 (Weaving Change Limited) Dynamic garment adjustment algorithm

Proposal Text

Weaving Change is a small tech start-up founded in Bristol with BIG dreams. We were founded with the hope of solving a global problem through individual actions. The fashion industry contributes an estimated 8% of global emissions; sees approximately 1 truckload of clothing burned or put into landfill every single second and 78% of clothing retailers acknowledge the likelihood of modern slavery within their supply chain. This is made more concerning by the fact that on average, only 10% of our clothes are worn regularly. The cycle of consumption and disposal of clothing is having a vast impact on both our planet and the people around us. We want to stop these cycles by showing people the value that their clothes have and helping them to wear them with pride whilst relying less on the harmful fashion practices that we know are so damaging. To do this we are developing a mobile app, Swerv, which uses the 'sneaky vegetable' approach to help people appreciate their clothes. Swerv, which was released on the 16th November 2024, features a digital avatar which looks just like you, from there you can scan in your existing wardrobe simply by taking a photo. This will digitise your clothes, creating a cartoonified version which you can then try on your avatar. Trying on your clothes in-app means you don't even have to get out of bed to choose an outfit, saving your outfits and sharing them with your friends is just a click away. If you're not sure what to wear, then our state-of-the-art Outfit Recommendation Algorithm (ORA) can recommend an outfit from your existing wardrobe! So, by incorporating these fun and useful features, we will help users experiment with their existing wardrobes and rely less on fast fashion.
One key aspect of Swerv is the scanning and digitisation of clothing. Every shirt is unique, and every pair of trousers has a different trim. And for every piece of clothing, we need to make sure it fits the users' unique avatar – making the problem exponentially more difficult as we add more clothes or avatars. This is where your project will come in. We need a way to streamline this process, to take a template of a piece of clothing and make it fit the body shape of all the avatars. Currently this is a manual process which is extremely time consuming and unsustainable.
The solution should be an algorithm that may or may not be integrated into a piece of software that is easy to use. It should take a garment and a rough placement of this on an avatar and produce a new version which fits the appropriate avatar (or suite of avatars).
If we accomplish this first goal of dynamically resizing templates to fit avatars, then we will explore using a diffusion based machine learning to generate these templates/cartoons from scratch simply by using a photo of an item of clothing.

Key goals:

- Create an algorithm that can resize items of clothing appropriately
- Develop this algorithm to take into account avatar body types
  Areas to explore:
- Outline recognition
- Point grouping and translation
- 2D vs 3D workflows
- Machine learning
  Who will you work with?
- You will work closely with our technical team including our Chief Operating Officer.
  What can we provide?
- We can provide some helpful resources such as avatars and clothing templates

- We may be able to provide computational resources such as virtual machines if required.
- Thorough help and guidance throughout the project including regular meetings to help solve problems

Information for students to help choose projects

An interesting design challenge in developing algorithms and features for an existing app, the client clearly defines a number of features to develop, but we believe there is plenty of scope to add more and make the project as challenging as your team likes.

Why do you want to work with students?

We are trying to solve a very complex problem and we believe that having a group of independent minds will greatly accelerate the process. We also love to work with people outside our immediate circle. This oppertunity is perfect for students looking to gain insight into how a small startup operates and potentially contribute to a larger project which may develop into a global product.

22 (University of Bristol/University Hospitals Bristol & Weston NHS Foundation Trust) A software application that will help clinicians and patients to decide when a hospital referral and assessment is needed for suspected papilloedema

Proposal Text

Background

The DIPP study team at the University of Bristol is conducting research to improve diagnostic and referral pathways for patients with suspected papilloedema from primary to secondary care (DIPP study: **https://www.bristol.ac.uk/primaryhealthcare/researchthemes/dipp-study/**).

Papilloedema is optic nerve swelling at the back of the eyes. It is caused by increased pressure in the brain and may be a sign of a brain tumour. Some patients may have no symptoms, and some have visual symptoms or headaches. Because it is often hard to tell if someone genuinely has papilloedema or not, many more people are referred to hospital than necessary by their GP or optometrist. This means that people who do have papilloedema may need to wait longer for appointments, leading to delays in their diagnosis and treatment. At the same time, people who are referred unnecessarily may undergo several unnecessary, expensive, and potentially invasive investigations, leading to greater health anxiety, healthcare and insurance costs.

Challenge

The goal of the DIPP study is to develop national guidelines for optometrists and GPs to help them identify patients with papilloedema more accurately and reduce the number of people referred to hospital who don't have it.

Solution

To address our challenge, the DIPP study team have conducted a Delphi survey of different health professional groups to reach consensus on which clinical scenarios should direct clinicians to refer patients to hospital and the clinical scenarios when this is not necessary or an alternative strategy is preferable, e.g. to visit the optician or GP. We have also reached consensus on the clinical variables that raise the risk of a patient from a routine referral to an urgent or emergency referral and which hospital service the patient should be referred to. Having reached consensus, we plan to publish our clinical guidelines so that other

clinicians and patients can benefit from using them. Using these guidelines as our template, we would now like to develop a software application that supports our clinical guidelines.

Goal

The aim of the software application is to take the user (clinician or patient) through a series of questions that asks them about presenting symptoms, clinical signs, and any investigation results. Depending on the user's answers to the questions, the software algorithm will suggest whether the patient needs to be referred to hospital or not, the urgency of the referral (if necessary) and which type of health professional should assess the patient next (if needed) in the community or hospital. The algorithm will be based on the clinical guidelines we have developed as part of the DIPP study.

Information for students to help choose projects

This is a relatively simple, but well defined brief, that means that your team would be able to fully develop a solution to a high level of finish. There may be scope for expanding the challenge, but this would involve discussing further with the client. An excellent potential impact in the healthcare context.

Why do you want to work with students?

I have previously been involved in 2 software engineering projects and both were good experiences. This is a good opportunity to help disseminate and increase the impact of the outputs of the DIPP study.

23 (PhysioActivity) Physical Activity Gamification

Proposal Text

PhysioActivity is a micro-SME providing a (medtech) platform to continuously observe movements performed using smartphone and wearable data. The platform is intended to provide physiotherapist recomendations based on the amount of biomechanical forces exerted on the body which is particularly relevant for patients with MSK disorders (eg rheumatoid or osteoarthritis). The platform can also be used in other context including prevention (ie when not diagnosed) or occupational (eg backpain at work).

Physical mobility and encouraging exercises and physical activity are UK priorities eg to address obesity and cardiovascular problems. However, medical and sport use cases seem to generally apply to people above 25 years old. So, the purpose if this project is to develop the User experience of the platform for younger population (i.e. students, teenagers..).

The project would best fit a software team to work on gamification aspects. The aim is to be compelling to encourage movement and activity in younger people, especially these not especially interested in sports. So, blue sky thinking highly encouraged any software developments and technological aspects including gamification, social media integration, and could be web, app, AI, VR or other tech centered.

Information for students to help choose projects

This is a relatively open-ended brief, that would suit a team happy to explore and refine the problem further. As mentioned in the brief, this would particularly suit a team interested in gamification.

Why do you want to work with students?

I have worked with students on other projects and I am particularly keen on helping them acquire industry experience. So also very keen on settng up training and onboarding the project in our current company practices.
Experienced people tend to be already formatted in a certain way. So I am particularly interested in students' fresh perspective when given a broad and open scope. This particular project is also relevant to student as the commercial target and deployment would be within younger demographic (which includes students).

24 (Our Rainwater) A severe weather alert system for sustainable urban drainage systems

Proposal Text

1. Who we are

Our Rainwater works with water companies, local authorities, schools, and individuals to help them manage their rainwater. This often means installing sustainable urban drainage systems (SuDS) which hold back or slow the flow of rainwater into drainage networks, reducing the risk of surface water flooding and sewer overflow, whilst also providing some drought resilience.

We are a team of hydraulic modellers, software developers, and community engagement experts, who work to put these systems in communities where they’re needed most, whilst maximising their impact, community adoption, and secondary benefits (such as biodiversity and sewer misuse reduction).

2. Your task

In order to keep these assets working as effectively as possible we would like you to build an alerts system that notifies asset-holders of expected severe weather. This gives them guidance on how they can prepare their system for high winds, high precipitation levels, and freezing temperatures.

Being prepared in advance reduces the risk of damage to their drainage infrastructure, whilst also maximising its effectiveness at providing storage for excess rainfall. Warning systems such as these are fundamental for preparedness, and building climate resilience, which is becoming ever more important in a rapidly changing (and urbanising) world.

3. Specification

The system is designed to work as follows.

- A SQL database stores records of assets, asset-holders, and alert templates.
- Each asset has an associated polygon describing the area that it drains.
- Each asset-holder has associated contact details and contact preferences.
- The database is administered by means of a authenticated web app.
- The web app has CRUD functionality, with different permissions for different user-types. For example administrators may modify all records, whilst asset-holders may only modify some aspects of their own records.

- A background service will poll the Met Office's National Severe Weather Warnings Service (NSWWS) API and/or RSS feed at regular intervals.
- When a weather warning is issued, the service will determine all impacted asset-holders by identifying those with drained areas that intersect the weather warning MultiPolygon.
- The service will issue an alert to the identified asset-holders, using the appropriate contact channel and alert template.
- Alerts will include a secure one-click un-subscribe mechanic for asset-holders to update their contact preferences without needing to log-in.

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4. Project delivery

Your team will start from scratch, designing the architecture, back-end infrastructure, and front-end interfaces, with access to our skilled development team for guidance and support. You will develop your software in a dockerised environment, using Git version control, to ensure that your work can be tested and deployed consistently. You can select appropriate architectures, framework, and languages yourselves, with agreement from our developers.

You will be broadly self managing, timelining out the project yourselves, and breaking it down into work packages or sprints that you can use to structure, track, and report on your progress. You can choose to limit the scope of the project by setting some of the objectives as stretch goals, or expand the scope of the project by requesting additional features from our development team.

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5. What you'll get

We will provide you with:

- A mock dataset of assets, asset-holders, and alert templates.
- Access credentials to the NSWSS API, and associated documentation.
- Support, guidance, and feedback from our development team.

There may also be a modest budget available for using paid services should a need be identified, but this is expected to be minimal.

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6. Communication

For queries related to the project specification or delivery itself, your first point of contact will be Ari Cooper-Davis, our Lead Platform Developer.

Information for students to help choose projects

This is your chance to work with an experienced software development team as a client - the brief is very clear and the technologies you'll be using are well defined. The project has the chance for a real environmental impact for local communities.

Why do you want to work with students?

We are a small start-up which formed as a spin-out from the University of Exeter, and as such we recognise the value of student talent, and enjoy working with students to build up their expertise. In fact, a number of our current employees started out working with us in a similar project/placement capacity, and went on to be offered jobs.

We are also a values-based organisation, motivated to support communities build resilience to climate change, so having students select our projects means that they share our values, which we believe is important for a healthy and rewarding working environment.

Finally, as a woman-led business, we appreciate how important it is for the diversity of our communities to be reflected in the teams supporting them (us!), so we enjoy working with people from all age groups, backgrounds, and walks of life, and working with university students is a good way for us to do this.

25 (NHS Cambridgeshire and Peterborough Integrated Care System) Finding a matched comparator population

Proposal Text

Integrated Care Boards (ICBs) are the legal entities responsible for the commissioning of health services at local level. ICBs commission healthcare for millions of people across England and Wales and they have the responsibility to evaluate services.

Evaluation generates learning and informs decisions, but no evaluation or bad evaluations impair learning, deny the possibility of improvement and perpetuate bad decisions. Sadly, evaluations are not carried out as widely as they should.

The purpose of this software development project is to create an automated tool that simplifies the process of defining a comparator population of patients based on the attributes and characteristics of a test population. This tool will be designed to address a critical gap in evaluation processes within healthcare settings.

ICBs are tasked with evaluating health services to determine their impact on outcomes, reduce inequalities, and ensure value for money. However, these evaluations often require significant technical expertise and manual effort, particularly in identifying and selecting appropriate comparator populations. This step is essential for ensuring the robustness and reliability of evaluations, but its complexity frequently forces teams to resort to before-and-after type of evaluations, which have well documented weaknesses compared to cohort-matched methods.

By developing this software, the project seeks to:

- Automate Comparator Selection: Enable the automated identification of a comparator population by analyzing patient attributes, test population characteristics, and other relevant parameters.
- Enhance Evaluation Efficiency: Streamline the evaluation process, reducing the technical demands on evaluators and enabling real-time or near-real-time evaluations.
- Democratize Data Usage: Lower the barriers to conducting robust evaluations, much like the democratization of genome data exploration, allowing a wider range of users to benefit from structured health datasets.
- Support Decision-Making: Provide actionable insights that inform healthcare interventions and policies, ultimately improving health outcomes, reducing inequalities, and ensuring the efficient use of resources.

This automated tool will be integrated into the broader context of ICB efforts to interlink health, social care, and community datasets, leveraging advancements in artificial intelligence and the increasing availability of structured health data. It will serve as a proof-of-concept for future tools that could be developed for other steps of the evaluation process thus automatising it e.g., capture and analysis of outcomes, visualisation, etc. These tools have the potential to revolutionize healthcare evaluation processes, fostering a culture of evidence-based decision-making across the system.

Information for students to help choose projects

This is a good project for a team interested in the health sector. The project may require work with the client to further define the scope of the project.

Why do you want to work with students?

The Health Economics and Evaluation Collaborative at the Cambridge and Peterborough ICS hosts students that undertake small projects with very defined goals. Often these projects are either small components of a larger project or initial, proof-of-concept type of endeavours. The experience has been positive and the learning generated from interacting with students from varying academic backgrounds has been rewarding in terms of product outcomes and knowledge mobilisation within the unit.

26 (Insight Media Group LTD) SEED2GROWTH

Proposal Text

Overview

Insight Media is a Bristol-based agency specialising in communication, dissemination, and exploitation for research projects. With extensive experience in FP7, H2020, and Horizon Europe, we cover topics across wide thematic ranges and collaborate with top universities and research infrastructures, maximising research impact through targeted, effective dissemination strategies. Our proposed collaboration with the University of Bristol's School of Computer Science is to develop an AI-powered tool that transforms how research outputs are communicated and disseminated. This innovation will enable researchers to create bespoke, targeted communications for relevant stakeholders, streamlining the connection between research and potential end users.

Our idea

An AI-powered tool to bridge the gap between research and industry. Researchers will input detailed information about their findings, which the tool will use to generate tailored communication materials targeted at specific audiences. These materials will be delivered to named individuals in industries known to have a vested interest in those research outcomes. The tool also automates the process of audience mapping and segmentation using advanced AI algorithms, ensuring precise targeting and engagement. It will tailor information for each recipient based on their engagement habits – media they most engage with (video, podcasts etc) will be the media they receive.

Unique results

- Bespoke communication: The tool will automatically generate tailored presentations, policy briefs, infographics, podcasts and other communications based on the target audience's needs.
- AI-driven engagement: Through intelligent audience mapping and segmentation, the tool will connect researchers directly with industry stakeholders interested in their work.
- Enhanced efficiency: By automating the labour-intensive tasks of stakeholder analysis, content creation, and dissemination, the tool will save researchers significant time and resources.
- Multi-format outputs: Dissemination outputs will include AI-generated podcasts, interactive digital content, and other innovative formats to maximise impact.

Effective dissemination is often a challenging and resource-intensive process for researchers. Creating a database of end users, conducting stakeholder analysis, and developing targeted materials require substantial expertise and time. Moreover, the growing volume of research outputs makes it increasingly difficult to capture the attention of busy industry professionals. This tool addresses these challenges by:

- Streamlining stakeholder identification and engagement.

- Automating the creation of impactful, audience-specific content.
- Enhancing visibility and accessibility of research results to relevant industry players.

Benefits

- Researchers: Gain an intuitive, AI-driven tool that simplifies dissemination, reduces administrative burdens, and ensures their work reaches the right audience at the right time in the most effective format.
- Industry stakeholders: Receive personalised, relevant information about research outcomes that align with their interests and needs, making it easier to identify opportunities for collaboration or implementation.
- Policy makers: Access concise, tailored policy briefs that effectively communicate the societal and economic relevance of research.

Why us?

Insight Media brings unparalleled expertise to this project. We have:

- Partnered in multiple EU-funded projects as WP leaders and coordinators, managing communication and dissemination efforts.
- Developed robust stakeholder engagement strategies, creating targeted communication materials that resonate with specific audiences.
- Witnessed the challenges researchers face in disseminating results effectively, inspiring this innovative solution.

Our deep understanding of research and industry landscapes makes us the ideal partner to develop this tool. We combine technical knowledge with practical experience, ensuring the tool is not only technologically advanced but also user-friendly and fit for real-world applications.

Scope

This project will involve the design, development, and evaluation of a prototype system using a user-centred approach. Key objectives include:

1. Developing an AI-powered system that automate audience mapping and segmentation based on research data.
2. Creating algorithms to generate bespoke communication materials tailored to specific audiences, including industry, policy makers, media and others.
3. Incorporating multi-format dissemination outputs, such as interactive presentations, infographics, podcasts.
4. Ensuring the tool integrates seamlessly with existing communication workflows.
5. Conducting iterative testing and evaluation to refine the system based on user feedback.

Outcomes

- A functional prototype of the AI-powered dissemination tool.
- Detailed project documentation, user guides and technical specifications.
- Insights into the tool's performance and potential enhancements, based on user testing.

Ideal for Bristol students

This is a unique and exciting challenge, allowing students to:

- Work on real-world problems with significant societal and economic impact.
- Gain hands-on experience in AI and ML, applying these technologies to solve complex challenges.
- Develop a user-centred system, enhancing their skills in software design, project management, and client collaboration.
- Contribute to a pioneering tool that bridges the gap between research and industry.

Support

We are committed to providing support to ensure success, including:

- Regular meetings with student teams, providing guidance, feedback, and insights into real-world dissemination challenges.
- Sharing our expertise in research communication and stakeholder engagement.
- Facilitating access to relevant data and resources for testing and evaluation.

Conclusion

This is the opportunity to revolutionise the dissemination of research outcomes. By combining our expertise with the talent and innovation of Bristol's students, we can develop a cutting-edge tool that empowers researchers, engages industry stakeholders, and maximises the impact of research.

Information for students to help choose projects

An extensive brief with a large variety of possible features to implement. A great chance for a team interested in the applicaiton of AI to communications.

Why do you want to work with students?

Having participated in many EU projects over the years, we see the value in working with the future innovators, academics, business leaders and developers of tomorrow. We really value the fresh insight younger people will give us, their understanding of how information is best received and leveraged, and the vital role technology plays in all this. We understand this market, students will add valuable new perspectives for our groundbreaking approach to research dissemination.