**Initial Project Overview**

**Development of a Geolocation System Featuring Layered Map Visibility and Collaborative Exploration**

1. **Overview of Project Content and Milestones**

The focus of this project is to design, develop and evaluate the prototype of a geolocation-based software product, applying software engineering principles in its implementation of dynamic map visibility and collaborative features. The product aims to encourage discovery by hiding unexplored areas of the map until visited, while enabling users to share progress and content with friends.

**Proposed Milestones:**

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| Week 3 | Initial Project Overview Form Hand-in |
| Week 4 | Initial System Design |
| Week 7 | Development of the fog-of-war mechanic with basic geolocation integration |
| Week 9 | Implementation of collaborative map sharing and map layers |
| Week 10 | Interim Report/Meeting |
| Week 12 | Development of POI’s, UI polish |
| Week 15 (End of Trimester 1) | Finish main development features/deliverables |
| Week 1 | User Testing, survey distribution, feedback analysis |
| Week 5 | Feedback implementation, documentation, Project ready to deliver |
| Week 12 | Poster presentation, dissertation submission |

1. **Main Deliverables**

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| **Mobile Prototype** | A functional mobile application with the layered map visibility and collaborative features. |
| **Project Documentation** | Documentation related to the project:   * Design diagrams * Requirements (MOSCOW diagram) * Technical documentation * Testing procedures * GitHub/Notepad ReadMe file * User Manual |
| **Demo Video** | A short video showcasing the main features and workflow of the system |
| **Evaluation Report** | Evaluation of the final product, analysing the prototypes useability, efficiency, and feedback gathered from users. |

1. **The Target audience for the deliverables**

This project is aimed at those who enjoy exploration and discovery, who are looking at gamifying their journeys and finding new routes they have not covered before. It also allows social groups to share their experiences and travels, creating opportunities for collaborative exploration and collective achievement.

1. **Work to be undertaken**

* Requirements engineering
  + Gathering and prioritising functional and non-functional requirements
* Data collection
  + Collecting app feedback from students using surveys to inform project decisions
* Analysis
  + Reviewing collected data and refining system features accordingly
* Evaluation
  + Measuring useability, efficiency, and overall user satisfaction through structured testing, analysis, and data collection
* Testing
  + Implementation of Unit tests, functional testings, and battery/efficiency assessments.
* Implementation
  + Building the prototype with map API’s (OpenStreetMaps), fog of war logic, and collaborative features.
* System Design (architecture, stacks, UI/UX wireframes)
  + Defining the architecture, selecting technology stacks, producing UI/UX wireframes for refinement.
* Review of existing apps
  + Analyse current applications (e.g. Fog of World, Bump, FOWIRL, Pokemon Go) to identify strengths and weaknesses, and opportunities for innovation

1. **Additional Information / Knowledge Required**

This project will be developed using Android Studio, the Java programming language, and OpenStreetMap as the mapping platform. It will extend my existing skills by providing experience with geolocation APIs, dynamic map rendering, and efficient data handling within a mobile environment.

In addition, I will be acquiring new knowledge in several key areas:

* Optimising accuracy and battery life to ensure efficient mobile performance.
* Privacy-preserving techniques for handling sensitive data responsibly
* Usability testing methods tailored for mobile applications to gather meaningful user feedback and improve design

1. **Information Sources that provide context for the project (similar projects)**

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| **Fog of World** | A mobile app where users uncover fog on maps by physically visiting areas  <https://play.google.com/store/apps/details?id=com.ollix.fogofworld> |
| **Bump** | A social app concept that connects users when they physically encounter one another  <https://play.google.com/store/apps/details?id=co.amo.android.location&hl=en_GB> |
| **Fowirl** | A soon to be released mobile app where users uncover fog on maps by physically visiting areas  <https://apps.apple.com/tr/app/fowirl/id6742189650> |
| **Assassins Creed: Valhalla** | A video game by Ubisoft which contains examples of uncovering areas of a map by visiting POI locations. |

1. **The importance of the project**

While mapping and fitness apps are widely available, most provide complete information upfront, which diminishes the sense of discovery. Few systems integrate dynamic map visibility with meaningful collaborative interaction. This project aims to fill that gap by:

* Encouraging exploration and outdoor activity
* Supporting social interaction through collaborative map sharing
* Offering a user-centric approach that balances engagement with privacy.

1. **Key Challenges to be overcome**

* **Efficiency**
  + Ensuring the system runs smoothly on mobile devices without lag or excessive memory usage.
* **Battery life**
  + GPS tracking and map rendering are resource-intensive, strategies should be devised to limit the cost.
* **User testing/feedback**
  + Recruiting users and gathering meaningful feedback within the project timeframe
* **Privacy**
  + Handling sensitive data responsibly, limiting unnecessary data storage