

Initial Plan

Location Privacy Application

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Initial Plan – Location Privacy Application

CM3203 – One Semester Individual Project, 40 Credits

Author: Shazaib Ahmad

Supervisor: Dr. George Theodorakopoulos

Roles of Supervisor

- Recording weekly meetings.
- General project advice.
- Guidance in location privacy research.
- Supervising progress of project.

Project Description

Location privacy is an increasingly concerning issue that is becoming more relevant year on year as the number of mobile devices we carry increase. With the number of Internet Of Things (IoT) devices, wearables and smartphones rising, we face the challenge of maintaining a secure level of privacy, preventing these devices and services from pervading our personal lives.

The project focuses on smartphone applications, as there are over 2 billion smartphone users globally, expected to rise to 6 billion by 2020 (Lunden, 2015). Smartphones make use of many web services when connected to the internet, some of which take our location; using it to actively record our current or recent locations. The use case for the application would be such that given a situation where sharing one's location may be undesirable; the user will be able to use the application to add noise to their actual location before transmitting. This would be especially meaningful when needing to transmit your location to a server – often through location-based searches, where your location data may be intercepted and your location could become known by an adversary. Often recent locations may be stored for an extended period of time as companies are able to use this for data mining purposes as well as the fact that users are often unaware of their location consistently being tracked and stored. Due to this, the underlying study of this project will be to also evaluate whether it is possible to receive meaningful results, if providing an artificial location, whilst retaining privacy.

A few aspects of the application's functionality must be considered, such as the level of noise added to the actual location of the user, so that the use of an artificial location does not become problematic; the more noise added, the more security we are adding by increasing the radius for possible artificial locations, however this will also reduce the relevance of retrieved results from any web services, i.e. restaurants nearby a user's artificial location, as they will need to travel further to reach such a location. Therefore, this project will technically tackle the balance of privacy and usability for such a security measure, whilst considering the semantics and geometry of a user's location, and employing methods for potential emergency transmissions of actual location.

Project Aims & Objectives

Required

- Create a mobile application to maintain location privacy.
 - Functionality and resource consumption will be evaluated.
- Add noise before transmission of location.
 - Should use longitude and latitude, altered slightly.
 - Allow users to alter how much noise is added within appropriate variations.
- Evaluate the effect of adding noise to the app utility.

Desirable

- Allow users to transmit their actual location periodically, if in danger.
- Explore if there is sufficient time whether location semantics can be incorporated.
 - Protecting location depending on contextual information and spatial geometry.

Ethics

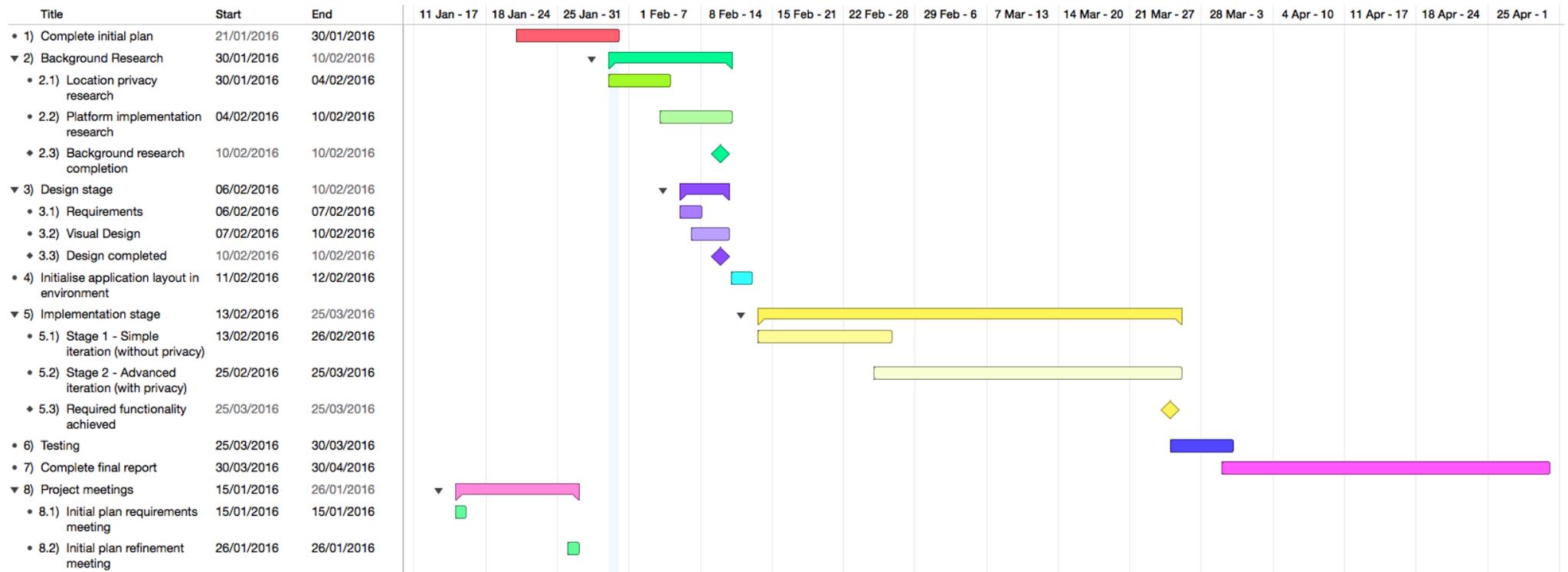
The project as proposed will not need an ethical review as it does not meet the requirements for an ethical review to be made. The project will not require any use of personal data to be collected or used. If this changes at any point during the project, the ethics approval will be requested.

Work plan description

1. Complete initial plan – Current plan that will be followed, subject to change through the duration of the project.
2. Background research.
 - 2.1. Location privacy research – Specific background on methodology of location privacy.
 - 2.2. Platform implementation research – Exploration of chosen platform specific to implementation.
3. Design stage.
 - 3.1. Requirements – Outlining requirements for the application based on assumptions.
 - 3.2. Visual Design – Use-case diagrams and other visual representations of the app.
4. Initialise application layout in environment – Setting up working environment for app utility.
5. Implementation stage.
 - 5.1. Stage 1 – Simple iteration - Aiming to implement without privacy elements within the app.
 - 5.2. Stage 2 – Advanced iteration - Aiming to build upon previous stage, with privacy elements, such as adding noise.
6. Testing – Thorough functionality and resource consumption tests, including usability.
7. Complete final report – Detailed documentation of the project covering the process of development.

Work Plan

The work plan description can be seen depicted as a Gantt chart below, where tasks are split across a weekly timeline.



Project meetings

Project meetings will be held with the project supervisor on a weekly basis and will be reflected in the work plan, as well as what was discussed. Meetings that alter the development of the implementation will be outlined in the subsequent report. Project meetings will be recorded throughout the duration of the project.

Deliverables

The deliverables will include an implementation in code of the location privacy app utility as well as a final report centred around the project with in-depth detail of each stage of the development process. The deliverables will be submitted by the 6th of May; the deadline of the project.

Bibliography

Lunden, I. 2015. 6.1B Smartphone Users Globally By 2020, Overtaking Basic Fixed Phone Subscriptions Comments Feed [Online]. Available at:
<http://techcrunch.com/2015/06/02/6-1b-smartphone-users-globally-by-2020-overtaking-basic-fixed-phone-subscriptions/#.ow6euq2:RPIH>
[Accessed: 22 January 2015]