LuminAR

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Project Introduction

Client & Project Background

Luminary Promotions, an Auckland-based promotions company that specialises in experimental advertising, are exploring the possibilities of GPS technology integration.

Luminary are specialists in Augmented Reality advertising. They hope to further their efforts with a location-based 'wayfinding' platform application.

Luminary have requested the assistance of the LuminAR group to realise their vision.

Rationale

GPS integration and data deployment are two fields foreign to Luminary. In order to build the 'wayfinding' platform application, Luminary need an easier way to integrate location technologies and remote data access.

LuminAR group were requested to create a user friendly interface for these technologies. Doing so will enable Luminary to produce the 'wayfinding' platform application without the need to interface with the system API's.

Objectives

• Learn Unity development practices, along with the related iOS and Android API's and protocols.

• Develop two Unity plugins — one for the integration of GPS services, the storing and maintaining of GPS nodes; and the other for the distribution of data from a remote information server.

• Produce diagrams and documentation for use and implementation of the two Unity plugins.

Methodologies

Research Methodology

We decided to use Action Research methodology, as it provided a structured and lightweight approach — ideal for a project dependant on research (Dick, 2000). As our need for research lessened with the revised project plan, it was performed on an 'as needed' basis.

Action Research suited our team as research tasks varied depending on the roles of each member. It allowed us to efficiently perform, record and share our investigations.

Development Methodology

Our development strategy followed Extreme Programming (XP) methodology. XP accommodates for projects with an uncertain, changing scope (Pierce, 2002) — ideal for our project as three significant scope changes occurred before development commenced.

Following Extreme Programming methodology enabled the group to efficiently plan and document our development. The final product was delivered three days ahead of schedule as a result of effective planning.

Quality Assurance

A consistent level of quality across all of our work was only possible by the collaborative effort of our team. Some of the quality assurance practices followed include:
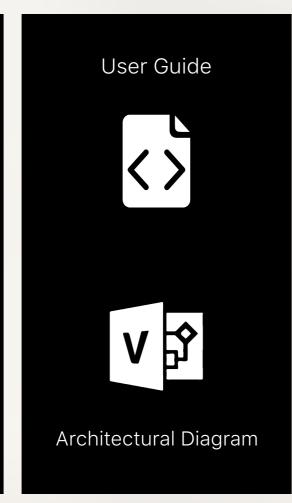
• Quality assurance standards for documentation, research and development were produced and followed.

• Templates for all documents were produced.

• Proofreading, acceptance testing, unit testing and peer programming.

Deliverables

Unity Plugins & Documentation

The two Unity plugins, architectural diagram and usage documentation were delivered ahead of schedule. The plugins implemented all of the GPS services and Asset Bundling functions required by Luminary.
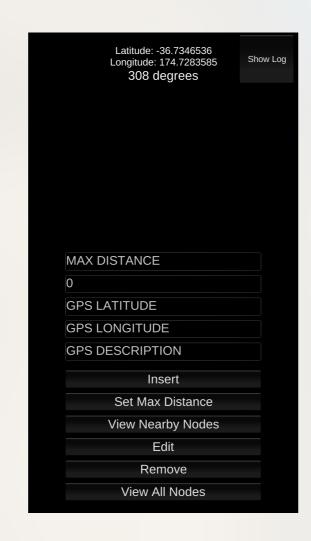
Testing Application

A Testing Application was produced in unison to the Unity plugins. The app allowed verification of the functionality of the plugins; and will be referenced by Luminary when creating the 'wayfinding' platform application.
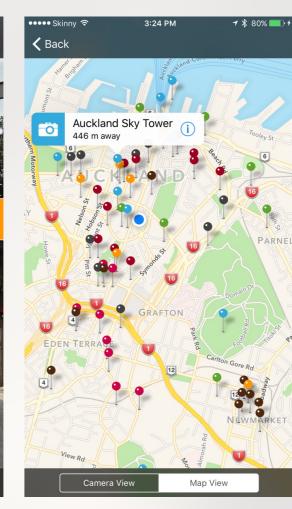
User Interface Prototype

Going beyond the requested deliverables, a prototype application was produced to demonstrate the use of the Unity plugins. The application provides an Augmented Reality view of nearby GPS nodes.

Team Development

Challenges

• **Scope Changes** — Our project plan was changed significantly three times before development commenced. After a disappointing mid-project review, we prepared a contract which prevented further changes, allowing us to begin development immediately.

• **Overdue Documentation** — The mid-project review highlighted the amount of documents that had not been completed. Each team member committed themselves to work three+ hours a day on the project to catch up on the overdue documentation.

• **Internal Conflict** — Conflict arose within our team during the development phase causing delays, decreased productivity and personal resentment between members. We overcame the conflict by having our supervisor mediate our conflict resolution process.

• **Time Management** — Spikes in activity occurred in semester one near each major deadline. We realised (following our mid-project review) that we needed to be more organised and planned steady work to be carried out in a much smoother semester two.

Technical Difficulties

• **New Development Platforms** — Unity, iOS and Android were development platforms foreign to most of our team members. Well-executed and documented research allowed us to quickly learn these environments, enabling us to complete the project in a timely manner.

• **Inaccurate Task Estimation** — Planning Poker was performed during a setup phase. Some estimations were inaccurate due to a lack of understanding. Fortunately, our revised project plan accounted for misestimation and we were able to complete the work on time.

References

Dick, B. (2000). A beginner's guide to action research. Retrieved 18 March 2015 from http://www.uq.net.au/action_research/arp/guide.html

Ekran, G. (2013). Microsoft Visio 2013 Viewer Icon. Retrieved 31 October 2015 from http://png-4.findicons.com/files/icons/2796/metro_uinvert_dock/256/visio_2013.png

De, S. (2012). Icon for C# file type. Retrieved 31 October 2015 from http://www.sushovan.de/design/icons/csharp.ico

Pierce, D. (2002). Extreme Programming. The Computer Bulletin, 44(3), 28-28.

Ask us for a demo of Augmented Reality

Jason Gerbes
1274664

Joshua Son
1388288

Paul Lee
1264218

Sean Young
1302108