FLINDERS UNIVERSITY

COMP-9710A Master Project Proposal

by

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This is the proposal for my
Master Project

in the
School of Computer Science

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Contents

0.1 Introduction

Title project : Functional testing and qualification of the Serval Mesh Extender

The Serval Project is a suite of technologies designed to facilitate and sustain mobile telecommunications in the absence of supporting infrastructure, such as cellular networks or electricity.

The two main components of the Serval Project are the Serval Mesh Extender Hardware and the Serval Mesh App. Basically the Serval Mesh Extender is a low-cost communications relay device that extends the range of communications among phones using Wifi technologie. The laboratory has a partnership with my university in France named INSA de Lyon so that each year, french students can help on the project as a one semester exchange program. This is why I am here now.

For the year 2017, the Australian Department of Foreign Affairs and Trade have commissioned the University to pilot Serval in the Pacific. Consequently, we have to prepare the Serval Mesh Extender technologies for field use in tropical-maritime environments, and without any dependencies on mains electricity. To this end the first Serval Mesh Extender is being redesigned to satisfy these requirements. However, this process is not yet complete.

0.2 Project Focus

Therefore there is a need to devise and apply a testing regime for the new Serval Mesh Extender design, to ensure that it meets the necessary functional requirements. Moreover we also have to ensure that the hardware units are easily possible to manufacturing. The focus of my project will be on the creation and application of such test protocols in order to be sure that the Serval Mesh Extender devices are ready for deployment in the field pilot.

0.3 Background Survey

Here are five papers and documents which help me writing this background survey : - http://pacifichumanitarianchallenge.org/ - The Serval Project : Practical Wireless Ad-Hoc Mobile Telecommunications. Dr. Paul Gardner-Stephen, Rural, Remote and Humanitarian Telecommunications Fellow, Flinders University and Founder, Serval

Project, Inc. July 22, 2011. - Serval Mesh Software-Wifi Multi Model Management. Dr. Paul Gardner-Stephen and Swapna Palaniswamy, School of Computer Science, Engineering and Mathematics, Flinders University, Adelaide, Australia. Amritpuri, Kollam. December 2011. - The Village Telco project: a reliable and practical wireless mesh telephony infrastructure. Michael Adeyeye and Paul Gardner-Stephen. P.J Wireless Com Network. 2011. doi :10.1186/1687-1499-2011-78 - The serval mesh: A platform for resilient communications in disaster and crisis. Global Humanitarian Technology Conference. IEEE 2013.

In November 2015 the Australian government called innovators, entrepreneurs, designers and academics to rethink humanitarian response with the Pacific Humanitarian Challenge. It received 129 applications from 20 countries across five continents in which they chose only five winners. The Serval Project is obviously one of them and since then has been piloting and implementing its innovative solution. The four other winners are Pacific Drone Imagery Dashboard, Pacific Local Supplier Engagement Project, an Easily-Deployed Low-Cost Unmanned Aerial System and a Mobile SME Insurance in the Pacific Island.

The purpose of these articles is to give an introduction into the genesis and motivation behind the Project which may be the first practical mesh mobile telephony platform. They are divided into four different themes. The first one explains the motivations of such a project and the different use-cases we can imagine for this. The second one provides brief introductions to each of the key technologies. The third one explore how these features can help in the use-cases introduced in section one. Finally, the last theme is a discussion about the trial with the first prototype.

It has been seven years that Paul and his researcher team work on Serval because it seems to them that there is a need for mobile telecommunications system of being able to continue to operate without any infrastructure (physical or organisational). In this case we could use it in a great variety of scenarios included poor countries without real infrastructures and natural disasters.
The Serval Project can be considered as a derivative of The Village Telco Project, specially of their Mesh Potato which is an unusually robust mesh Wifi router with integrated analog telephone port designed to provide local fixed-line style communication. As this one was already supposed to be use in Africa and Asia, it is designed as a light power consumer. Also we can communicate or phone an other Mesh Potato by using the IP address of these. Serval Project implements the same feature but with adding phone number in it so people can use normal phone number instead of IP address.

0.4 Methodology

0.5 Conclusion