ABSTRACT

An increasing number of appliances and portable devices, such as cordless phones, Personal Digital Assistants (PDAs), and laptops are used in our everyday life, both at home and work. These devices coexist, on many occasions, with non-portable devices, such as fixed phones and personal computers. All these devices have something in common. The user's state is not taken into account when they provide their service. This results in the user being constantly interrupted, when not desired or missing very urgent notification(s) if the devices are turned off. Additionally, having so many different devices, each providing unique and different notifications, consumes unnecessary time from the user, who must attend to them separately.

In order to improve this situation we seek to exploit the improvements in the fields of speaker and speech recognition, and text to speech synthesis. We were also inspired by the concept *"Nomadic Radio"*. This concept is defined as "... a wearable computing platform that provides a unified audio-only interface to remote services and messages such as email, voice mail, hourly news broadcast, and personal calendar events..."[1]. To achieve the goals proposed by *"Nomadic Radio"* a good context-aware multimedia infrastructure must also exist.

We considered the *"SmartBadge version 4"* a suitable platform to test the concept of *"Nomadic Radio"* extended by context-awareness. Hence, this thesis studied how to exploit audio for mobile users, by building a client/server application using *"SmartBadge version 4"*. This application consists of a playlist manager that will manage audio files by placing them in the appropriate position in the playlist as various clients dynamically generate new audio content or send pre-existing content such as MPEG files. This application interacts with several clients, all communicating via the *UDP* protocol. One of these clients provides a *user interface* for selecting audio files and determining the order in which to play them. Another client uses *text-to-speech* synthesis to generate audio alerts. Another client is a *player* for several different types of audio files, enabling a user to listen to these files (songs in different formats, notifications,...) all on the same device, resulting in an approximation of a *"Nomadic Radio"* with the sensor rich *"SmartBadge version 4"* as the underlying hardware platform.

ACKNOWLEDGEMENTS

First of all, I would like to deeply thank my project supervisor at KTH, Professor Gerald Q. Maguire Jr., for his great guidance and support, always transmitting his enthusiasm and positive attitude towards the thesis and always willing to share his knowledge.

I would also like to thank Giulio Mola, Roberto Casella, Andreas Wennlund, and Sean Wong, fellow students at KTH's Wireless Centre at the time of the realisation of this thesis, for their suggestions and co-operation; Pere Oriol and Sjur Bakka, students at KTH at the time of the realisation of this thesis, for their ideas and feedback, were always there when I needed them.

Finally, I would like to express my gratitude to my family who have constantly given me the love and support I need.

FOREWORD

This Master of Science thesis discusses work done partly in conjunction with work done by Giulio Mola and Sean Wong. Thus a complete solution to the problem will be presented in this thesis along with their theses: "Interaction of Vertical Handoffs with 802.11 Wireless LANs: Handoff Policy" by Giulio Mola[18] and "Context-aware Support for Opportunistic Mobile Communication" by Sean Wong[19]; along with three other theses: "GGSN Support for Opportunistic and Adaptive Mobile Communication" by Asim Jarrar[21], "Reconfigurable Application Network through Peer-2-Peer Discovery and Handovers" by Roberto Casella[22], and "Context-aware Wearable Device for Reconfigurable Application Networks" by Andreas Wennlund[13].

Solutions presented in this thesis are intended to be compatible with solutions presented in both Mola´s and Wong´s work.

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LIST OF FIGURES AND ACRONYMS

FIGURES

ACRONYMS

AR	Augmented Reality
AP	Access Point
DNS	Domain Name Server
GPRS	General Packet Radio Service
GPS	Global Positioning System
HTML	Hyper-text Mark-up Language
IP	Internet Protocol
IR	Infrared
LAN	Local Area Network
NFS	Network File System
PDA	Personal Digital Assistant
RF	Radio Frequency
SGML	Standard Generalised Mark-up Language
TCP	Transport Control Protocol
UDP	User Datagram Protocol
URL	Uniform Resource Locator
VPN	Virtual Private Network
XML	eXtensive Mark-up Language
WLAN	Wireless Local Area Network
WWW	World Wide Web