

# The Mobile Teleporter: A Video Follow-Me System

Serko Katsikian, Enrico Rukzio

Computing Department, Lancaster University, UK  
s.katsikian@lancaster.ac.uk, rukzio@comp.lancs.ac.uk

**Abstract.** As mobile devices become more powerful, they affect our everyday lives in ways we don't even realize. Meanwhile, the need for available services in an ever changing, dynamic environment, has given rise to the concept of context-aware computing. Ubiquitous environments augmented with a variety of sensors can provide an adaptable infrastructure to provide services in a personalised context-based approach that has never been possible in the past. Research in the area of mobile computing has therefore focused in developing applications that can work in coordination with such context-aware environments to make our lives more comfortable and enrich our experiences in the digital world. This demonstration presents a prototype which can stream multimedia content to devices in the user's environment while employing a localization mechanism that senses the location of the user's mobile phone and "teleports" the media to the device closest to her at any moment. The prototype also provides a remote controller module running on the mobile phone to allow the user to have control of the streaming media.

**Keywords:** mobile interaction, video follow-me, localisation.

## 1 Introduction

During the last decades we have seen the introduction of a wide range of mobile devices into our everyday lives which have reconfigured the way we interact with each other, conduct our businesses and live our lives. The mobile phone is one of the most widely spread electronic devices that can now provide much more than just mobile telephony. Furthermore, as electronic devices of every kind (e.g. microwaves, TVs, radios, computers) have become an indispensable part of our everyday activities, mobile phones provide an ideal opportunity to build applications that will interconnect all these appliances in order to build pervasive, context-aware applications that can sense the environment and adapt it according to our specific needs [1, 2]. In this context, the proposed demonstration will present a prototype application which runs on a Nokia Series 60 phone and in coordination with Linux computers in the user's environment, streams multimedia content to their displays according to the user's location. This Mobile Teleporter was motivated from a vision of the future where mobile devices will be interacting with our environment to provide personalized services to their users who will essentially become the "convergence point" of multimedia services [3]. The Linux computers used in the demonstration can be hence envisioned in the future as TV sets which can interact with a mobile phone to provide context-aware services according to our needs.

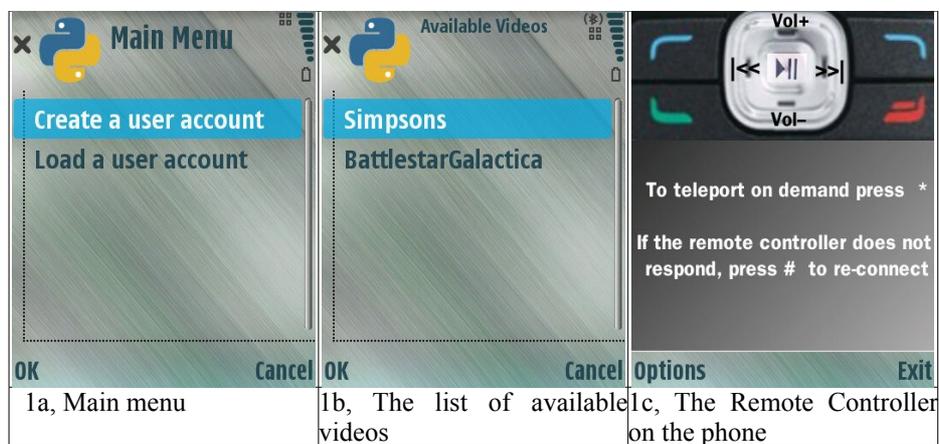
In the prototype to be presented, the user interacts with the mobile application

which contacts the Linux computers and identifies which one is closest to the user based on the Bluetooth signal strength. Then the user is provided with a list of available media stored on a central server and chooses to start a media stream on the closest computer's display. The application developed also provides the user with a remote controller module which allows him to control the playing media from the mobile phone. Essentially as the user moves away from one computer and closer to another, the application senses this change in location (by querying Bluetooth signal strength) and transports the playing media from one display to the other. For this demonstration two Linux computers and one Nokia N80 phone will be used.

## 2 System Overview

The application is broken down into two parts. The client application developed runs on the Nokia phone while the server application runs on the computers and interacts with the client to provide the necessary services. When the user first runs the application on the mobile phone, she has to create a new user account and a default profile. The profile is essentially a collection of the devices (in this case the computers) that can support the services of the application (i.e. are running the server application).

Figure 1a shows the main menu of the application which the user interacts with upon initialization. After creating an account the user can load it by selecting the appropriate option in the main menu screen. The user's account is a collection of the profiles that she has created. A different profile with different devices can be created for example for the home environment and a different one for the office.



**Figure 1: Screenshots of the prototype**

Upon loading a specific profile, the application tries to connect over Bluetooth to all devices stored in it and requests a signal strength value from each. In this demo the two computers will send a value each and the phone will identify which one is closest to the user by comparing these two values. Then the application will continue communicating with the closest PC and will request a list of the available media. If the computer closest to the user is the central server itself, then it will access its local

file system and will send this list to the phone over Bluetooth. If however, the closest computer to the user is not the central server, it will first contact the central server (which stores the media) over WiFi to get a list of the available media and will then send this list to the phone over Bluetooth. The user will then be provided with a list of directories on the phone as the one shown in figure 1b. When the user clicks on any of these items she is presented with a list of the respective media. Then the user chooses a specific item (i.e. a video file) and the application sends this choice over Bluetooth to the computer with which it has been communicating. The computer then starts playing the media on its display while the user is provided with a remote controller interface to control the media distantly from the mobile phone (figure 1c).

### **3 User Experience and Conclusion**

A preliminary user study indicated that the users really liked the idea of their media “following” them in their environment and also enjoyed the availability of a remote controller on their phone. The study also revealed that users prefer to have explicit control of the media teleporting from one device to another rather than have it done automatically by the application. Overall the users expressed a high level of satisfaction when interacting with the prototype and gave encouraging feedback for such context-aware applications.

In conclusion, the Mobile Teleporter is a classic “follow-me” application which provides the user with continuous availability of her multimedia content according to her location. While the user interacts only with her mobile phone, the application running on the phone itself communicates with nearby devices over Bluetooth and identifies the one closest to the user. The user can then select a media from a list and start streaming it to the nearest device's display. If the user moves closer to another object in her environment, the application senses this relocation and “teleports” the streaming media on the new object's display. Furthermore the application features a remote controller which allows the user to manipulate the media from the phone thus providing complete control to the user just from the mobile phone.

### **4 Acknowledgement**

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