Chapter VI
Next Generation Mobile Multimedia

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ABSTRACT

The number of consumer devices that are being equipped with networking capabilities is increasing rapidly. This is seen as a fundamental strategy within the consumer electronics domain where failure to provide such support may result in a considerable loss in market share. As end users become more comfortable with the idea of networking the devices they own, there will be a need to allow the heterogeneous devices they own to seamlessly work together irrespective of their capabilities or conventional usage scenarios. Addressing this challenge means that next generation mobile multimedia will be highly multidisciplinary where advances from many research domains will be included. In parallel, users will be empowered where they will not only be able to generate user content, but also interact with it. Content itself will become increasingly more influenced by the environment, where new technologies, such as sensor networks, will play a significant part. Social networks and immersive environments are commonplace, where users now choose to socialise within these environments. Many mobile multimedia solutions will capitalise on the benefits social networking technologies provide to help change the face of next generation mobile multimedia, where real-time interaction with content at anytime and anyplace will become standard. In this chapter we provide a discussion on the state-of-the-art research initiatives that are trying to address these challenges. A discussion is presented on some of the more recent background work and a view of what future mobile multimedia might look like. Throughout the discussion we present the challenges faced by many research communities and the likely trends that will emerge given such challenges.

INTRODUCTION

We have reached a stage where the way we interact with technology has moved beyond personal computing. Mobility has significantly influenced this change where many devices are now equipped with increased computation and networking capabilities. This has bridged the gap between fixed and mobile computing, subsequently blurring how applications and services can be used. Innovative usage scenarios capitalise on this integration where location, time, context, and the user situation have become key factors in how next generation mobile multimedia is delivered.

The Internet has typically enjoyed clients with advanced capabilities, such as personal computers; nevertheless, mobile devices are now forming part of these networks allowing them to utilise the benefits being connected to the Internet provides. This is beginning to have an affect on our digital experience where it is becoming difficult to envisage life without mobile devices or the Internet. This dependency has influenced the way we operate in the digital world and increased our appetite for networked activities. For example, people now use their mobile phone to watch television, purchase food from dispenser machines, and pay for train tickets automatically as they enter the platform. The ability to exchange simple messages and multimedia content has proved to be a phenomenal success and is currently being extended to include real-time messaging services and global positioning systems to notify users when friends are in their immediate vicinity. Such usage scenarios have evolved far beyond what mobile phones where initially designed to do and this is set to continue.

Moving beyond the ability to talk, mobile data networks have seen considerable advances and have changed since the inception of second generation telecommunications (2G). This drive to increase data throughput to better support multimedia has seen aggressive competition where it is still difficult to ascertain how cellular networks such as the Universal Mobile Telecommunications System (UMTS), better known as third generation (3G) and high-speed downlink packet access (HSDPA), better known as three point five generation (3.5G), will fair against alternative approaches such as wireless fidelity (WiFi) and Worldwide Interoperability for Microwave Access (WiMAX). This uncertainty has lead to many manufacturers creating solutions that accommodate different networking capabilities. Rather than trying to predict future trends, applications are shipped to abstract the underlying differences, thus providing a truly ubiquitous network where UMTS and HSDPA, as well as WiFi and WiMAX, with the help of the Mobile Internet Protocol (MobileIP), and IPv6, can seamlessly interoperate. This will arguably provide a platform on which mobile multimedia services can be effectively deployed (Peddemors, Eertink, Bargh, & Niemegeers, 2007).

Given such platforms, proponents suggest that mobile TV will push multimedia forward. This has resulted in a number of broadcasting standards, which include digital video broadcasting-handheld (DVB-H), digital mobile broadcast (DMB), and media flow link only (MediaFLO) (Paulson, 2006). In parallel, research initiatives aim to further extend the mobile TV model to make multimedia more interactive. For example, mobile multimedia may build on the advances seen within social networking allowing people to view, create and publish content, via their mobile phones, onto portals such as YouTube, Blinkx, TVEyes or Skypecasts (McLaughlin, 2007).

Mobility itself is changing and there is a trend towards integrating mobile devices with the environment itself. For example, the gaming industry has tried to utilise the benefits of mobility to create augmented reality where animated scenes are superimposed onto the real-world environment (Piekarski & Thomas, 2002). Virtual pets have also been developed for mobile devices that form part of sensor networks – depending on the readings from temperature sensors located within