Chapter 1
Contemporary Issues in Handheld Computing Research

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ABSTRACT

Mobile phones have become ubiquitous in today's society. However, mobile users are no longer satisfied with simple phones but instead expect ever more powerful functions to be available from their mobile devices. Advanced phones known as smartphones allow mobile users to perform a wide variety of advanced handheld functions such as browsing the mobile Internet or finding a nearby theater showing a specific movie. The design and development of these new, improved handheld functions require the help of handheld computing research. This article introduces handheld computing research using three themes: (i) mobile handheld devices, (ii) mobile computing, and (iii) current issues in handheld computing research. Information about other handheld topics of interest to researchers is given in the last section.

INTRODUCTION

Mobile phones are extremely popular in today's fast-paced society. They are no longer a luxury but instead have become an essential part of most people's lives. However, after many years' experience with simple mobile phones, many mobile users now expect more sophisticated func-

tions from their mobile phones. They not only use mobile phones to make phone calls or send short messages, but also take advantage of the capabilities of advanced mobile phones known as smartphones to perform activities such as mobile Web browsing and checking their email. According to Gartner, Inc., a market research company, the numbers of PCs, smartphones, and cellular phones shipped in 2008 were:

- 302.2 million PCs, including desk-based PCs, mobile PCs, and X86 servers (Gartner, 2009a),
- 139.3 million smartphones, which are mobile phones with advanced functions such as PC-like functions (Gartner, 2009b), and
- 1.22 billion mobile phones (Gartner, 2009c).

The number of smartphones shipped has increased rapidly in recent years and is now only slightly under half of the number of PCs shipped. Analysts expect that the number of smartphones shipped will surpass the number of PCs shipped in the near future.

Desktop computing research has been extensively studied, but handheld computing research is fairly new and is unfamiliar territory for most people. It involves a wide variety of subjects including

- Android systems, computing, applications, and programming
- BREW systems, computing, applications, and programming
- Browsing the mobile Web
- Client-side mobile-commerce computing, applications, and programming
- Context/location-based services, computing, and applications
- Embedded systems, computing, and applications
- Energy saving
- Handheld components such as micro-browsers, cameras and scanners; data synchronization such as infrared and Bluetooth wireless communication; and batteries
- Handheld devices, architecture, and systems
- Handheld hardware and software integration
- Handheld input and output methods, components and peripherals

- Handheld specifications, standards, guidelines, software, and tools
- iPhone systems, computing, applications, and programming
- Java ME systems, computing, applications, and programming
- Mobile advertising and sales
- Mobile and wireless networks
- Mobile commerce applications and systems
- Mobile commerce, business, and banking
- Mobile instructions and classrooms
- Mobile inventory management and resource planning
- Mobile messaging, emailing, broadcasting, and blogging
- Mobile offices, management, and services
- Mobile semantic and intelligent Web applications
- Mobile social networks and virtual communities
- Mobile traffic, travel, and weather reports
- Mobile Web 2.0 and further developments
- Mobile Web and data mining
- Mobile Web and Internet access
- Mobile/handheld algorithms and methodologies
- Mobile/handheld data management
- Mobile/handheld entertainment and gaming
- Mobile/handheld human computer interface and user interface design and implementation
- Mobile/handheld operating systems and platforms
- Mobile/handheld programming languages and environments
- Mobile/handheld security and payment methods
- Mobile/handheld/embedded database systems
- Palm OS systems, computing, applications, and programming
- Remote intranet access

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