

Mintrack Introduction: Mobile Applications

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In the explosion of research on mobile computing, the area that has received the least attention has been software and applications. As Milojcic, Douglass and Wheeler noted in 1999, "The lack of applications is the biggest challenge for deploying any form of mobility." This statement is still true today.

While great advances have been made in wireless networking infrastructures, the services and software to deliver value to users has not been as widely developed. As yet, mobile services pale in comparison with the services available on one's desktop.

One of the most important types of problems in the deployment of mobile services revolves around issues of *dynamically distributed architecture*. All of the papers in this Mintrack are concerned with this 'software infrastructure' that will make it possible for particular applications to run more effectively.

Each paper begins with the question, "*What are distributed architectural requirements of mobile applications that are fundamentally different from conventional applications?*" Then each in turn identifies a different, partial set of requirements, shedding light on a key aspect of mobile computing.

The first paper points out that mobile applications are required to cope with the physical movement of the user's device. That is to say, *location is dynamic*. In "An Architecture for Location Aware Applications", James Nord, Kåre Synnes, and Peter Parnes show that there is a need for a single, integrated platform for receiving and comparing location information. They propose a generic positioning protocol that provides a single context to make location information available to applications and facilitates providing more accurate location information.

The second paper is concerned with the resource shortages that are intrinsic to computing with small, mobile devices, and focuses in particular on the fact that *battery power is precious*. Thomas Kunz and Salim Omar argue in "An Adaptive MP3 Player: Reducing Power Consumption and Increasing Application Performance" that the trade-off between power use and application performance can be balanced by

adaptively dividing an application's objects between the mobile device and the resources available in the wireless network and fixed host.

The final paper confronts the challenge of giving users effective access to complex, information-rich services designed for PCs through the medium of the mobile phone, with its limited display and other capabilities. In other words, in mobile devices *clients are thin*. Sean Landis and Venu Vasudevan, in "Reaching out to the Cell Phone with Jini," propose a specification that mediates between a thin client such as a mobile phone and a network that has access to robust applications on a wired network.

Together, the three papers in this minitrack point to an important and as yet largely unmapped terrain: architecture design for computation and communications dynamically distributed in space, time and computational resources.