Augmented Reality (AR) exists in the space between the real world and virtual reality, containing both real world imagery and computer graphics which augment the user’s view with more information than would be available otherwise. The following three characteristics are often used to help define an AR system:

1. Combines real and virtual
2. Interactive in real time
3. Registered in 3-D

Wearable computers along with sensory input devices and wearable displays allow mobile users to be immersed in augmented reality. Mobile AR has many potential uses, from construction and maintenance to tourism to military applications among many others. Superman’s x-ray vision could even be possible with mobile AR. There are however many difficulties to overcome for successful mobile AR applications.

This talk will describe what many of these challenges are, and summarize work that has been done to begin solving them, focusing on three main areas. We will first look at the hardware requirements of mobile AR, and the limitations currently imposed by hardware. We will next talk about the registration problem of aligning virtual objects with the real world, including several approaches to solving this problem both in a lab environment and outdoors. Lastly we will talk about techniques used in different areas of mobile AR. We will discuss techniques for interaction, outdoor modeling, authoring of AR content, information management and collaboration. We will conclude by discussing in general what problems currently exist with mobile AR, and possible directions to solve them.