

TUTORIALS

October 13, 2010

MESSAGE FROM THE TUTORIAL CHAIRS

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ISMAR tutorials expand the knowledge, understanding, and interest in mixed and augmented reality and afford insight into the state-of-the-art of this quickly advancing field. We offer tutorials that are presented by top researchers, span a wide range of topics, and offer information that is relevant to many different types of attendee, including students, researchers, developers, and artists. We hope that the information imparted through the tutorials will help attendees in the future as they develop the next technological breakthrough, 'killer app', or artistic masterpiece.

09:00-17:00 **Fundamentals of Head Worn Displays** **Room 311**

► Instructors: Jannick P. Rolland, Optics at the University of Rochester
/ Kevin P. Thompson, Optical Research Associates

This tutorial will quickly review key aspects of stereoscopic human vision. We will then provide some taxonomy of Head Worn Displays (HWDs) according to types and field of view (FOV). We will then learn some must-know about the optics in HWDs that is critical to understand as a user or as a researcher conducting perception studies, for example, using HWDs. Finally, the presenters will share their experiences in developing and evaluating some of the display technologies since the early 1990s.

09:00-12:30 **HANDHELD AUGMENTED REALITY GAME DESIGN** **Room 314**

► Instructors: Blair MacIntyre, School of Interactive Computing at the Georgia Tech

Handheld Augmented Reality Games present an exciting opportunity for mobile game designers to create games that combine virtual play worlds with the real world. By moving games off of the screen and into the real world, Augmented Reality Games have the potential to sidestep the limitations of small mobile displays by creating the illusion of looking through a window into a much larger world. As a result, Augmented Reality Games create new opportunities for physical and social play that we will explore in this tutorial, using examples of game prototypes to illustrate Augmented Reality game mechanics with a focus on social, physical, and tangible interaction.

09:00-12:30 **DEVELOPMENT CYCLES FOR QUALIFIED USABILITY TESTING IN AUGMENTED REALITY** **Room 316**

► Instructors: Marcus Tönnis, FAR group

Developing user interfaces for AR not only requires programming skills but also knowledge about a general understanding of how the potential user of an application behaves and thinks. It also requires testing of the newly developed interaction techniques to check if the new interface meets the requirements and ideas.

While technical and creative aspects of such user interfaces have been covered in ISMAR for several years now, the demand for usability testing in AR is a more recent trend. Statistical techniques for analysis of collected data can easily be reused from other disciplines but the development process is still not mature. In combination with efforts to strengthen usability studies in conferences, this often leads to fully formal user studies on preliminary systems. The novel user interface often is underdeveloped in comparison to an already existing interface, resulting in a bad outcome for the new technique. Exhibiting AR techniques to test users in addition often generates diverse reactions, ranging from dislike (bulky wired devices) to enthusiasm (tech geekness, wow effect).

Both facts lead to reduced quality of the results of the study.

This tutorial investigates these issues and introduces a development process for AR interfaces. The process aims on generating awareness that the formal user study only makes sense after the new system has been fully developed and that consistent wording matters when presenting a system for collecting subjective impressions.

09:00-12:00 **DEVELOPING WITH QUALCOMM'S AUGMENTED REALITY PLATFORM**

Room 401

► Instructors: Jay Wright, Director, Qualcomm; Istvan Barakonyi, Staff Engineer, Qualcomm; Daniel Wagner, Principal Engineer, Qualcomm; Professor Blair MacIntyre, Georgia Tech and Qualcomm Game Studio

Announced last week (October 4, 2010), the Qualcomm Augmented Reality SDK will enable a new breed of applications that delivers interactive 3D experiences on everyday objects, such as 3D gaming experiences on tabletops and interactive media experiences on product packaging and promotional items. Qualcomm's SDK, available at no charge, provides developers with an advanced feature set and supports the ability for users to interact with AR applications by simply touching real world surfaces. Join us for an informative tutorial introducing Android development for AR; learn how to develop applications using Qualcomm's AR SDK; and, experience game design with the Qualcomm AR extension for Unity.

Developing with Qualcomm's Augmented Reality Platform	Presenter	Affiliation and Time
Augmented Reality Applications, Markets, and Qualcomm AR Developer Challenge	Jay Wright, Director, Qualcomm	Qualcomm (10 minutes)
Introduction to Android Development for AR	Istvan Barakonyi, Staff Engineer, Qualcomm	Qualcomm (60 minutes)
Break		10 minutes
Developing with the Qualcomm AR SDK	Daniel Wagner, Principal Engineer, Qualcomm	Qualcomm (60 minutes)
Break		10 minutes
Game Design with the Qualcomm AR Extension for Unity	Professor Blair MacIntyre, Georgia Tech and Qualcomm Game Studio	Georgia Tech (60 minutes)