



Department of Electrical and Computer Engineering

Title: *Real-Time Hand Tracking for Human-Computer Interaction*

Dr. Paris Kaimakis

Wednesday, 26th September 2012, 17:30 – 18:30

**Room KENTP. ΠΤΕΡ. - E113, Old Campus
University of Cyprus**

Abstract: The successful commercialisation of Microsoft's Kinect has recently demonstrated the increasing demand for reliable, low-cost, real-time Markerless Motion Capture systems -- systems that can sequentially estimate the subject's 3D pose based on visual information, without markers. Such systems have numerous lucrative applications, e.g. in human-computer interaction, computer gaming, animation, automated surveillance, and more.

The last decade has seen minimal progress in the field, mainly due to the conflicting design criteria of such systems: real-time processing indicates that implementation of gradient-based algorithms is necessary for tracking, while the low-cost criterion disqualifies the use of dedicated hardware and therefore imposes use of low-level and often ambiguous data. The problem is that gradient-based approaches become very unstable in the presence of such ambiguity.

In this talk we introduce a system designed to circumvent these difficulties, achieving real-time tracking of the human hand with high precision and *zero* hardware requirements further to an ordinary laptop. The talk will focus on the system's early design and modelling steps, as well as its Bayesian formulation.

Biography: Dr Paris Kaimakis conducted his doctoral research in the Signal Processing Laboratory at the University of Cambridge focusing on solutions to the Markerless Motion Capture problem. After receiving the PhD degree in 2009, he worked as a Research Associate in the Computer Laboratory, again in the University of Cambridge. His post-doctoral research concentrated on the automation of urban road traffic surveillance and flow-volume estimation using visual means and sequential Monte Carlo methods. In 2010 he joined Autonomy, the UK's largest software firm, as a Research and Development Engineer. While in Autonomy, he worked in the development of augmented reality applications for the iPhone/iPad and for Android devices. He has been involved in the development of the popular Aurasma App, the world's first visual browser (over 3 million users, available at the App Store and Google Play) and worked in related side-projects such as 3D head tracking, image processing and image analysis. In 2011 Paris returned to Cyprus and co-founded a company dedicated to the development and commercialisation of new-generation, human-oriented, controller-free computer interfaces.