Title: High Altitude Platforms: Delivering future Broadband Communications

Short Abstract: An overview of High Altitude Platforms (HAPs), Communication Satellites and Terrestrial communication systems focusing on radio resource management techniques for HAPs. : HAPs are airships or planes that will operate in the stratosphere, at an altitude of between 17 and 22km. Such platforms will have the ability to be deployed within a short period of time and have the potential to provide Broadband Fixed Wireless (BFW) access services to a large number of users over a wide area. HAPs can achieve a high capacity by using a large number of wireless transceivers, each using a directional antenna to create cells on the ground. These transceivers are co-located on the platform, and they offer line-of-sight communication to a geographic service area of approximately 60km diameter. Its altitude and potentially high angles of elevation allow higher spectrum reuse and capacity. The design of this system is much more complicated than the terrestrial cellular communication systems we know. The physical construction and position of the HAP differs, as it is not a fixed base station. Resource allocation techniques (RATs) for HAPs must be designed based on the physical design of HAPs and benefit from its advantages. The aim is to maintain uniform while minimum blocking levels all over the coverage area as well as minimal interference. By doing this we can maximise the number of users in the system and ensure fairness in the service. In this talk, the HAP system will be presented in contrast with the traditional terrestrial systems pointing out similarities and differences between them. We will then talk about what is cell overlap and how can improve the quality of service of a HAP system. Furthermore, we will present part of the research work dealing with various channel allocation techniques designed for HAPs.

Title: It's all about data: Radio Resource Management for future wireless mobile networks. Satisfied Customers – Profitable Market!

Short Abstract: The radio frequency spectrum is a natural resource, which is finite and increasingly precious. As the number of wireless devices increases dramatically there is a need to reconsider the traditional way of regulating the radio frequency spectrum in order to ensure effective use and reuse of it. Current studies show that although most of the usable spectrum bands have been allocated, they are highly underutilized. Cognitive Radio (CR) is the new radio concept proposed for revolutionizing spectrum management in a flexible and fair manner allowing primary users (higher priority - legacy right) and secondary users (lower priority – opportunistic channel assignment) to share their resources, thus maximizing utilization of the radio spectrum. Cognitive Radio (CR) is an adaptive, intelligent radio and network technology that can adjust itself to operate on different radio frequencies by detecting available channels in a wireless spectrum and changing its transmission parameters to make full use of them. It also has the ability to sense the presence of the primary users, thus moving into new bands when necessary to minimize interference.

Short biography: Dr Konstantinos Katzis received his BEng degree in Computer Systems Engineering and his MSc degree in Radio Systems Engineering from the University of Hull (UK) in 2000 and 2001 respectively. In 2001 he became a member of the Communications Research Group at the University of York (UK) were he remained there until the end of September 2006. In March 2002 Dr Katzis attended a professional short-course in parallel with his PhD studies on "Small Terminal Satellite Communications: VSAT Systems" which took place at the University of York (UK).

From 2001 to 2006, Dr Katzis has been working towards the development of highly efficient resource allocation techniques as well as handoff techniques optimised for the operation of High Altitude Stratospheric Platform communication systems (HAPs). His work, involved modelling of the platform movements and simulating the effects on the communications. He has also been looking at the different aspects of radio resource management, including cognitive radio, fairness in Quality of Service, dynamic spectrum sharing and coexistence. Dr Katzis has been involved with various European funded projects such: HeliNet (2000-2003), CAPANINA (2003-2006), HAPCOS / COST297 (2005-2009) "High Altitude Platforms for Communications and Other Services" and COST action IC0902 (2009-2013) entitled "Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks". Currently, Dr Katzis is the Vice-Chair of IEEE1900.6 Working Group focusing on Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communication Systems. Since October 2006, Dr Katzis has been working as an Assistant Professor at the Department of the Computer Science and Engineering at European University Cyprus (EUC).