Πανεπιστήμιο Κύπρου
University of Cyprus

School of Engineering
Department of Electrical and Computer Engineering

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# Department of Electrical and Computer Engineering

**Title:** «Bicoprime Factorisation Theory: A Robust Control Perspective»

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with the University of Manchester

**Wednesday**, 08th February 2017, 17:00 – 18:00
Room XOD02 – 013, New Campus – University of Cyprus

**Abstract:**
Bicoprime factorisations (BCFs) are a generalisation of the widely used coprime factorisations. Though they were introduced at roughly the same time as coprime factorisations, they have received negligible attention from the control engineering community. BCFs are closely related to polynomial matrix descriptions that form the basis for many important tools in control theory including state space methods. BCFs are of significant interest in the field of robust control as they induce an appealing uncertainty structure able to capture a multitude of modelling errors. Additionally, using BCF theory, robust stabilisation can be achieved via the solution of reduced dimension Riccati equations by selectively omitting stable modes of the plant. Furthermore, by imposing a normalisation property on a BCF, lower bounds on the achievable robust stability margin of a feedback interconnection can be evaluated a-priori.

This talk will outline the basic principles of BCF theory including the QR-BCF parametrisation, internal stability tests, the BCF uncertainty structure and normalised BCFs. A practical example will be presented, considering the attitude stabilisation of a quadrotor Unmanned Aerial Vehicle (UAV).

**Biography:**
Mihalis Tsiakkas is a post-doctoral research associate with the University of Manchester Robotics Group based at the Dalton Cumbrian Facility. He received the BEng, MSc and PhD degrees from the University of Manchester in 2011, 2012 and 2016 respectively. His research interests include robust control theory, bicoprime factorisations, Negative Imaginary systems theory and networked systems.