Networked Control Systems Laboratory
Center of Excellence DEWS
Department of Engineering and Computer Science
and Mathematics

Raphaël Jungers

FNRS Associate and
Professor at UCLouvain (Belgium)

Joint spectral characteristics: a tale of three disciplines

Abstract: Joint spectral characteristics describe the stationary behavior of a discrete time linear switching system. Well, that's what an electrical engineer would say. A mathematician would say that they characterize the asymptotic behavior of a semigroup of matrices, and a computer scientist would perhaps see them as describing languages generated by automata. Because of their connections with these wide research topics, joint spectral characteristics have been at the center of rich and diverse research efforts in recent years. They are notoriously very hard to compute (NP-hardness, Undecidability, etc. are the rule rather than the exception), but it turns out that one can often get around these difficulties, and modern optimization techniques seem particularly useful for studying them. I will survey and connect several powerful and interesting results, emphasizing the role of optimization methods. I will present applications, ranging from wireless control protocols to viral diseases treatment, malicious agents tracking, etc...

Short bio: Raphaël Jungers is a FNRS Associate and Professor at the Universite catholique de Louvain, Belgium. His main interests lie in the fields of Computer Science, Graph Theory, Optimization and Control. He received a PhD in mathematical engineering from the Universite catholique de Louvain (2008), and an engineering degree in applied mathematics, both from the Ecole Centrale Paris, France (2004), and from the Universite catholique de Louvain (2005). He holds a minor degree in Electrical Engineering from UCLouvain (2005). He has held various invited researcher positions, at the Department of Computer Science of the Universite Libre de Bruxelles (2008-2009), at the Laboratory for Information and Decision Systems of the Massachusetts Institute of Technology (2009-2010), and at the University of L'Aquila (July 2011). He is a FNRS Associate and a BAEF fellow. He was the recipient of the IBM Belgium 2009 award and a finalist of the ERCIM Cor Baayen award 2011.
Website: http://perso.uclouvain.be/raphael.jungers/

Wednesday March 27TH, 2013–15:30
"Sala Riunioni DEWS"