Dynamic Wireless Broadcasting and Other Applications in the Topic of Stochastic Networks

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The talk includes two parts. In the first part, the speaker will introduce the problem of dynamic wireless broadcasting. Broadcasting information in wireless networks includes many applications such as updating software in mobile phones, dispatching distress messages in ad hoc applications and delivering media streaming. Due to the interplay of scheduling and arrival dynamics, broadcasting while adapting to network variability is extremely challenging. The only previously known solution relied on the construction of all spanning trees, which is complex and not attractive for wireless applications. The speaker's talk will focus on the case of a directed acyclic graph. He will explain how the broadcast capacity is expressed in this case and will give a new solution to this problem via the use of a maxweight-type algorithm. The key idea in the solution is to impose in-order delivery of packets to each node in order to simplify the description of the network state.

In the second part of the talk, the speaker will briefly go through a number of recent developments in the area of stochastic networks and network optimization, describing how to control an overlay network with a few number of routers, how to perform distributed load shedding while minimizing the energy and how to perform loop-free backpressure.

Speaker's Bio:

Dr Georgios S. Paschos has been a Principal Researcher in the Mathematical and Algorithmic Sciences Lab of Huawei in Paris, France, since November 2014. He is a leading the network control and resource allocation team on the topics of network control and optimization.

Dr Paschos received the diploma in Electrical and Computer Engineering in 2002 from Aristotle University of Thessaloniki, and his PhD degree in Wireless Networks in 2006 from University of Patras, both in Greece. In 2007-2008, he was an ERCIM Postdoc Fellow in VTT, Finland. For the period 2008-2012, he was affiliated with The Center of Research and Technology Hellas - Informatics and Telematics Institute (CERTH-ITI), Greece. He also taught in the University of Thessaly as an adjunct lecturer (2009-2011). In the period 2012-2014 he was a Postdoctoral Associate at MIT's Laboratory for Information and Decision Systems (LIDS) working on dynamic control of networks. His research interests encompass the area of network optimization and dynamic algorithms, and in particular emerging networking paradigms such as Content-Centric Networking and Caching, Software-Defined Networks, and Next Generation Cellular Networks.