

Energy Harvesting Wireless Communication Networks

By

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Abstract: Wireless communication networks composed of devices that can harvest energy from nature will lead to the green future of wireless, as energy harvesting offers the possibility of perpetual network operation without adverse effects on the environment. By developing effective and robust communication techniques to be used under energy harvesting conditions, some of the communication devices and networks can even be taken off the grid. Energy harvesting brings new considerations, most notably, intermittency of available energy and its temporary storage, to system level design of wireless communication networks, leading to new insights. On the information theory front, these considerations lead to new problem settings.

The goal of this talk is to furnish the audience with fundamental design principles of energy harvesting wireless communication networks established in our recent work. The focus will be on identifying optimum transmission scheduling policies in various settings, the ensuing algorithmic solutions leading to design insights. Time permitting, recent results on information theoretic limits will also be presented.

Speaker's Bio: Aylin Yener is a professor of Electrical Engineering at The Pennsylvania State University. She joined Penn State's faculty as an assistant professor in 2002, and was an associate professor in the years 2006-2010. During the academic year 2008-2009 (sabbatical leave), she was a visiting associate professor of Electrical Engineering at Stanford University. Her research interests are in wireless communications and networking, information theory, and network science, with recent emphasis on energy harvesting green communications and information security. She was a recipient of the NSF CAREER award (2003), the DARPA ITMANET young investigator team award (2006), Penn State Engineering Alumni Association (PSEAS) Outstanding Research

Award (2010), IEEE International Conference on Communications Best Paper Award (2010), PSEAS Premier Research Award (2014), IEEE Marconi Prize Paper Award (2014) and the Leonard A. Doggett Award for Outstanding Writing in Electrical Engineering at Penn State (2014). She is a fellow of the IEEE.

Dr. Yener served as a technical program (co-)chair for various conferences for the IEEE Communications Society (2008-2014). She was an associate editor for the IEEE Transactions on Communications (2009-2012), an associate editor and an editorial advisory board member for the IEEE Transactions on Wireless Communications (2001-2012). She served as the student committee chair for the IEEE Information Theory Society 2007-2011, and was the co-founder of the Annual School of Information Theory in North America in 2008. Dr. Yener is currently a member of the board of governors of the IEEE Information Theory Society (for the term 2015-2017) where she previously served as the treasurer (2012-2014).

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