

Optimal Offline and Competitive Online Strategies for Transmitter-Receiver Energy Harvesting

Rahul Vaze

School of Technology and Computer Science, Tata Institute of Fundamental Research, India

A joint transmitter-receiver energy harvesting model is considered, where both the transmitter and receiver are powered by (renewable) energy harvesting source. Given a fixed number of bits, the problem is to find the optimal transmission power profile at the transmitter and ON-OFF profile at the receiver to minimize the transmission time. With infinite capacity at both the transmitter and receiver, optimal offline and optimal online policies are derived. The optimal online policy is shown to be two-competitive in the arbitrary input case. With finite battery capacities at both ends, only random energy arrival sequence with given distribution are considered, for which an online policy with bounded expected competitive ratio is proposed.

Speaker's Bio:

Rahul Vaze received his B.E. in Electronics Engineering from Madhav Institute of Technology and Science, Gwalior, India in 2002, and his M.E. in Telecommunications from Indian Institute of Science, Bangalore, India in 2004, and his Ph.D. from The University of Texas at Austin in 2009. Since Oct. 2009 he is a Reader at the School of Technology and Computer Science, Tata Institute of Fundamental Research, Mumbai, India. His research interests are in multiple antenna communication, ad hoc networks, combinatorial resource allocation. He is a co-recipient of the Eurasip best paper award for year 2010 for the Journal of Wireless Communication and Networking, and recipient of Indian National Science Academy's young scientist award for the year 2013 and Indian National Academy of Engineering's young engineer award for the year 2013.