Wireless-Powered Communication Networks

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Since far-field wireless power transfer provides a great opportunity to remotely energize low-power consuming devices that might not have embedded power source or may be equipped with limited size rechargeable batteries, it is considered to be a promising solution for various applications. In this presentation, a summary of research works on RF energy-harvesting communication networks are discussed. More specifically, energy-efficient resource allocation for wireless-powered communications under non-orthogonal multiple access (NOMA) scheme is investigated. Also, optimal strategies focusing on the throughput and the system energy efficiency of wireless-powered communication (WPC) networks in the presence of delay-limited sources are characterized, and impact of non-zero mean signal for energy-efficient operation of full-duplex wireless information and power transfer (WIPT) are studied. Furthermore, analytical expressions for quality-of-service driven time allocation strategies are derived and throughput maximizing algorithms are developed in the presence of untrusted nodes.

Bio: Dr. Zewde received the B.Sc. and M.Sc. degrees in Electrical Engineering from Bahir Dar University and Addis Ababa University, respectively, Ethiopia, and the PhD degree in Electrical and Computer Engineering from Syracuse University, in 2017. He completed the Future Professorate Program, and was a recipient of the Outstanding Teaching Assistant Award at Syracuse University. He has been working in academia and industry since 2004, and currently, he is an Assistant Teaching Professor in the Department of Electrical Engineering and Computer Science (EECS) at Wichita State University. His research interests include wireless information and power transfer, energy efficiency and convex optimization, cognitive radio networks, application of wireless-powered sensors for biomedical engineering, smart grid communication, and security.