Some Energy-Efficiency Perspectives on Pollution Monitoring Sensor Networks

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About the Speaker

Swades De received his PhD in Electrical Eng. from the State Univ. of New York at Buffalo in 2004. He is currently an Associate Professor of Electrical Eng. at IIT Delhi. Prior to this, he was an Assistant Professor of Electrical and Computer Eng. at New Jersey Institute of Technology (2004-2007). He worked as a post-doctoral researcher at ISTI-CNR, Pisa, Italy (2004), and has nearly 5 years industry experience in India on telecom hardware and software development (1993-1997, 1999). His research interests include performance study, resource efficiency in wireless networks, broadband wireless access, and communication and systems issues in optical networks. Dr. De currently serves as an Associate Editor of IEEE Communications Letters and Springer Photonic Network Communications journal. He is a member of IEEE, IEEE Communications and Computer Societies, and IEICE.

About the Talk (registration: https://meetings.vtools.ieee.org/meeting_registration/register/21989)

In this talk some of our recent results and ongoing works on energy efficiency perspectives of pollution monitoring sensor networks will be presented. We will first discuss the energy consumption characteristics of the pollution sensors. We will see that the underlining feature of many current-day pollution sensors is the energy consumption during sensing as well as their sleeping stages, which could be quite higher than the energy required in nodal multi-access communication activities. In view of significant consumption for pollution sensing, we will highlight the relative costs of energy harvesting options at the field nodes, namely “Solar only” versus “RF assisted solar energy harvesting.” To this end, we will argue that, having a mobile node for assisting in field sensor data collection and energy transfer would help – in not only alleviating the funneling problem in data collection but also reducing cost of recharging the field sensors. Some nodal operation level optimizations will be discussed next, followed by the discussion on RF energy harvesting optimizations, namely, multi-hop RF energy transfer and ambient in-network energy transfer. Specifically, we will present some of our experimental studies, where the gains via multi-hop energy transfer are demonstrated. We will also discuss our perceived current-day technology constraints on applying the energy routing concept. Before we conclude, an example case of RF energy harvesting aware sensor network will be outlined on which we have been working.

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For more information contact Nirwan Ansari (973)596-3670 or Amit Patel (a.j.patel@ieee.org). Check **http://web.njit.edu/~ieeenj/comm.html** for latest updates. Directions to NJIT can be found at: **http://www.njit.edu/about/visit/gettingtonjit.php**.