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Abstract: Challenges to WISP Application Designers

In this talk, I will describe the lessons my group at the University of Massachusetts Amherst has learned in two years of building applications on the WISP. In particular, I will focus on the challenges—some fundamental to the class of devices, some peculiar to WISP prototypes—we have identified along the way.

The designer of a WISP-based application faces difficult challenges that are not relevant to other kinds of deployments, e.g. tethered networks or mote-based sensor networks—challenges that may constrain her design. Inter-component distance, bursty transmissions, multipath effects, occluding materials, and moving components are just a few of the factors complicating RF harvesting. Furthermore, a lack of energy guarantees makes using the WISP's nonvolatile storage a non-trivial effort. I will present measurements and empirical observations that illustrate and delineate these challenges and others. I will also outline current and upcoming work that aims to ameliorate some of the design difficulties.