SWIFT: LARGE: Averting Wireless Spectrum Pollution in the Era of Low-Power IoT (# 2030154)

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OBJECTIVES

IoT is generally a "spectrum polluter".. But can it be a partner for spectrum management?

Goals: Design spectrum awareness...

- Using Ultra Low Power IoT Platforms
- Enabling Location-Awareness of Interferers
- Ensuring Performance, Range & Scale
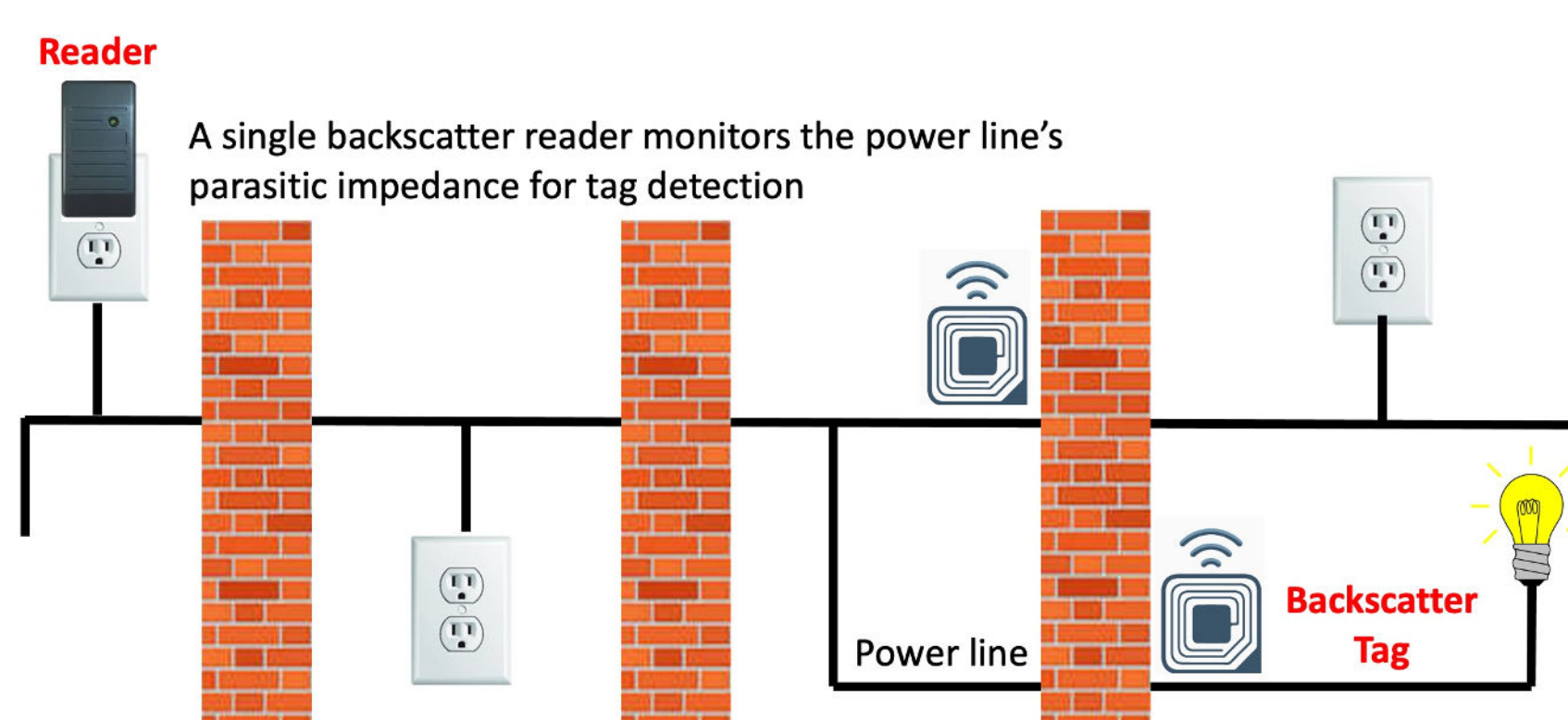
SPECTRUM SENSING WITH RFIDs

Can we use inexpensive and battery-free RFID tags to build maps of spectrum occupancy over wide bandwidths?
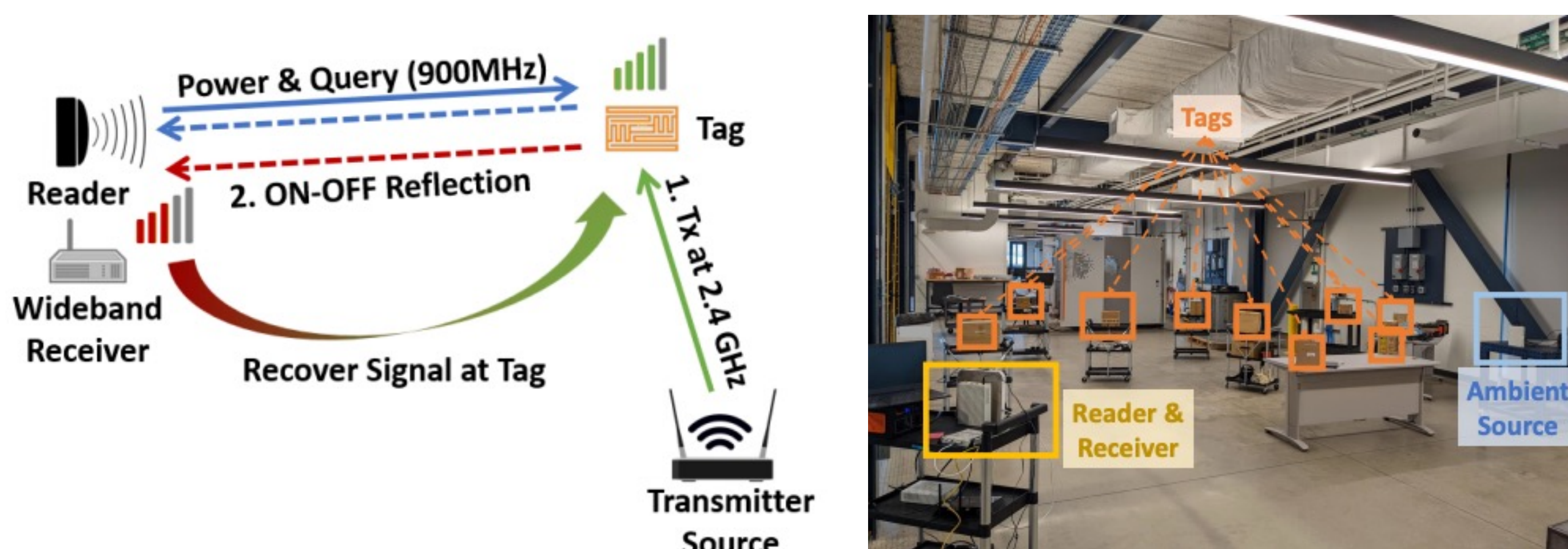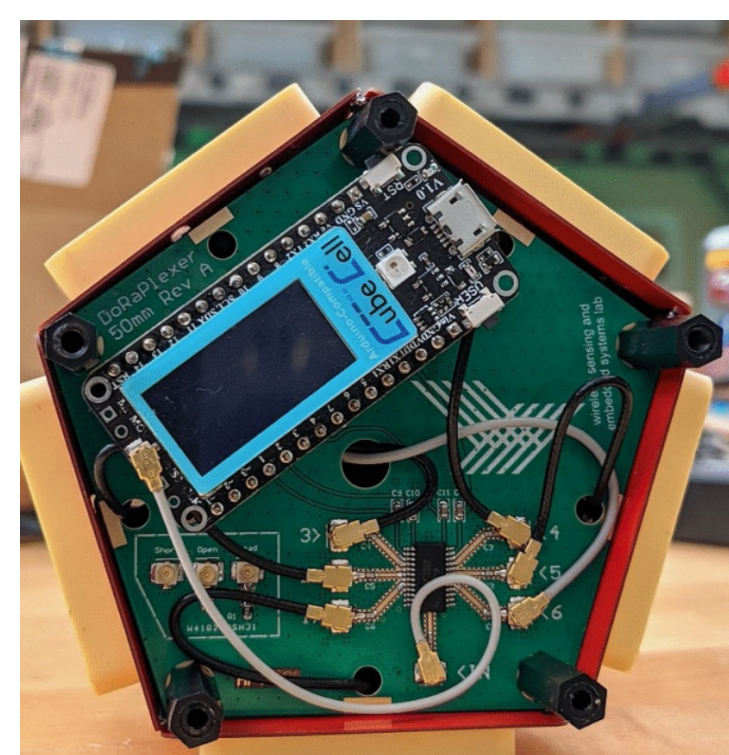

Paper at [MobiCom 2023]

OPTIMIZING RANGE OF IoT

Can ambient materials and novel frontends enable new ways to improve the communication range of low-power IoT?

Extending backscatter via power lines

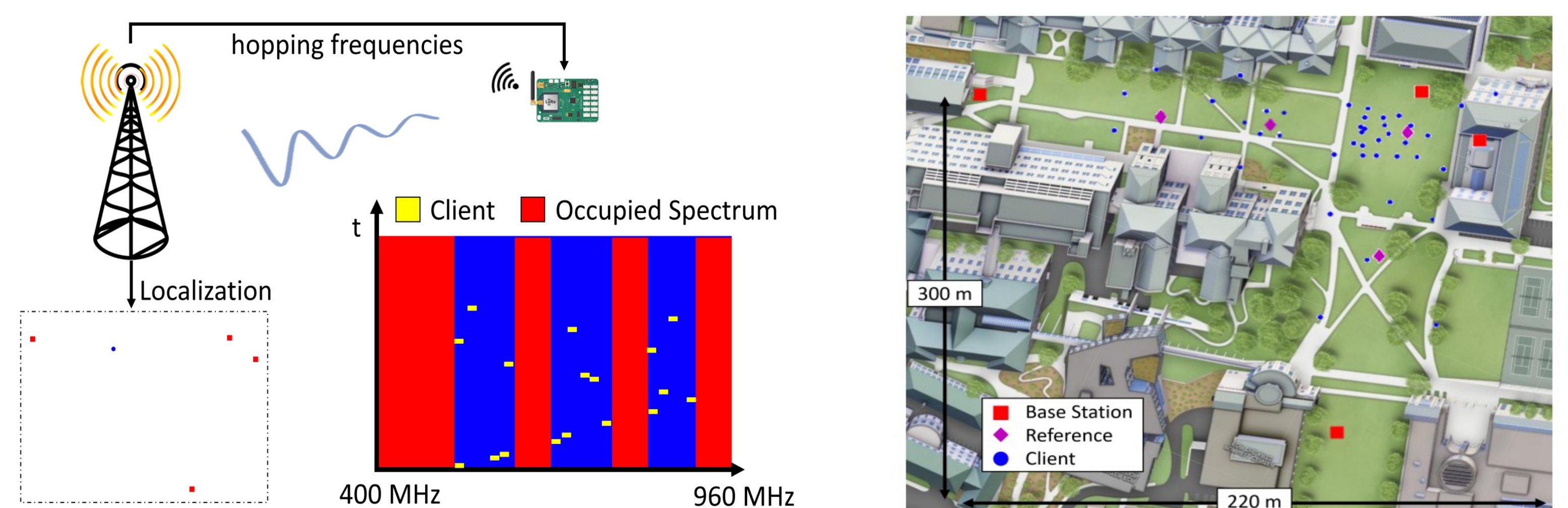Directional antenna designs for low-power IoT platforms

Papers at [NSDI 2022, UbiComp 2021]

LOCALIZATION AT LOW-POWER

Can we locate low-power (10-year battery powered) IoT platforms (LoRa-enabled) over long range and high accuracy?

Paper at [IPSN 2021, IPSN 2023]

BROADER IMPACTS

The First LP-IoT Workshop at MobiCom:
A new forum for research on low-power IoT Wireless

K-12 Outreach Efforts:
CMU Spark Saturdays Hands-on Workshops

FUTURE WORK

Enabling Low Power Spectrum Sensing for Smart Manufacturing and Radio Astronomy

URL: https://swarunkumar.com/grant2030154.html

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