
I. NAME AND AFFILIATION

Joseph Camp is an Assistant Professor and J. Lindsay Embrey Trustee Professor of Electrical Engineering at Southern Methodist University (SMU) in Dallas, Texas.

II. EXPERTISE AND SCIENTIFIC CONTRIBUTION

Dr. Camp has performed hundreds of thousands of wireless measurements in residential and downtown urban areas leading to in-situ findings in the areas of modulation rate adaptation [1], flow asymmetries [2], the effect of wireless overhead [3], and multi-hop fairness [4]. He was the chief network architect of the Technology For All (TFA) Mesh Network that serves thousands of users in an under-served neighborhood in Houston [5]. Earlier this year, he received an NSF CRI as the PI for the Dallas-AREa Tesbed for Context-Aware Cognitive Research (DART-CARs), an infrastructure to perform wireless measurements across a diverse set of environmental contexts and enable context-aware wireless algorithm design and analysis. He is also a co-PI on an NSF MRI for a Wireless Networking Testbed and Emulator (WiNeTestEr), a large-scale, high fidelity channel emulator. Both infrastructures enable study of wireless frequency bands from 700 MHz up to 6 GHz.

To achieve the context-aware research objectives of DART-CARs, we had to design a “supernode” which was capable of next-generation features of wireless systems today. The DART-CARs supernode consists of a unit under test for measuring wireless performance, a smartphone for measuring environmental context data, a spectrum analyzer to evaluate the environmental noise, and a laptop to facilitate data synchronization, automation, and storage. We use two different units under test to evaluate wireless performance: the Wireless Open-Access Research Platform (WARP), a custom hardware platform Dr. Camp worked on a team to develop at Rice University which enables clean-slate design and observability of the network stack [6,7] and the MicroTik/Ubiquiti platform, an off-the-shelf platform that enables operation on 700/900 MHz and 2.4/5.8 GHz and high transmission powers to enable many more contexts from the DART-CAR deployment. As part of Dr. Camp’s mobile phone embedded design course, multiple project teams have designed parts of the supernode. We are currently evaluating urban settings at speeds up to 60 MPH in the Dallas area with plans deployment and testing in suburban and rural areas. The work will allow measurement and classification of link-level performance in various environmental contexts, design and evaluation of context-aware protocols, and a quantification of the sensing accuracy and training measurements required to enable such protocols.

III. FUTUREHETNETS BENEFIT TO CANDIDATE

The workshop would be particularly beneficial to Dr. Camp to understand how other researchers and systems were concurrently using wireless spectrum for supporting such users on the large-scale channel emulator (MRI) and hearing various types of contexts that are being used by different frequency bands to refine the in-situ measurement campaign (CRI). Also, gaining feedback about some of our research approaches to designing time-intensive measurements and context-aware protocols would be helpful. Finally, it would be useful to hear about upcoming NSF funding opportunities and potentially establish collaborations with other attendees.

IV. NSF TRAVEL SUPPORT

The candidate requests NSF travel support.

REFERENCES