

Internet of Things for Smart Homes, Cities, and Contested Environments

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Short Bio:

Dr. Sreenivasan Ramasamy Ramamurthy is an Assistant Professor in the Department of Computer Science at Bowie State University. His research spans the areas of wearable and ambient sensing, machine learning, statistical learning, resource (computing and networking) optimization, and the Internet of Things (IoT). His goal is to develop cyber-physical systems that can sense (individually or collaboratively) to collect high-quality data, extract informative features using statistical and machine learning approaches, and study the interrelation between the features and the application-specific domain knowledge to create a feedback mechanism to assist the domain experts with intelligent cyber-physical systems.

Prior to joining Bowie, he received Ph.D. in Information Systems at UMBC. During his doctoral studies, he worked on various projects, such as studying the relationship between human activities and underlying cognitive impairment, sports analytics, and extracting physiological signals from videos. Besides, he has worked on developing fault-tolerant, collaborative, opportunistic sensing and computation frameworks for contested environments at the Center for Real-time Distributed Sensing and Autonomy (CARDS) at UMBC. He also holds a Master's in Biomedical Engineering from the Vellore Institute of Technology (VIT) and his Bachelor's in Electronics and Instrumentation Engineering from Amrita School of Engineering, India. He also had short research stints at the University of Adelaide, Australia as a visiting researcher and the Indian Institute of Technology Bombay, India as a junior research fellow.

Abstract:

The rapid adoption of the Internet of Things (IoT) in our daily lives, such as in smart homes, cities, and other contested environments, invites ample opportunity to develop Cyber-Physical Systems (CPS) and their applications to address real-world problems. In this talk, I will first discuss the various challenges associated with a cyber-physical system's sensing and computing phase with an example of "Cognitive Health Assessment using Wearables for Older Adults." Then, using this example, I will talk about challenges such as inter-class similarities, intra-class variations, class imbalance, limited labeled data, and abundant unlabeled data, how these challenges affect us, and how to overcome these challenges algorithmically. Following these discussions, I will talk through the research questions and the process involved in developing CPS for other environments, such as smart cities (where resources such as networking, power, compute power, and so on are available in abundant) and contested environments (where resources are constrained).

Contact ([Dr. Sreenivasan Ramasamy Ramamurthy, sramamurthy@bowiestate.edu](mailto:sramamurthy@bowiestate.edu)) if you have any question.