Electrical & Computer Engineering

S E M I N A R

Louisiana State University

Towards Intelligent Wireless Sensing in the Era of IoT

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Abstract—With the proliferation of IoT (Internet of Things), now we are living in an environment surrounded by various wireless facilities which provide rich information about the human body and activities. By analyzing the wireless signals that bounce off the human body, we can perceive human activities in the environment. Such wireless sensing systems can support device-free interactions between humans and their physical surroundings and enable a new generation of applications capable of performing complex sensing and recognition tasks. In this talk, I will introduce how we extract information related to the human body and activities from wireless signals by developing and applying deep learning techniques. In particular, I will introduce how we fuse complementary information from heterogeneous sensors and adapt the system to new environments on the task of human activity recognition. In addition, I will also present our work which is the first to utilize commercially available IoT wireless devices for human skeleton/mesh reconstruction in real-time, which can facilitate more sophisticated Human-Computer Interaction (HCI). In general, the developed wireless sensing systems in our research can improve people's working efficiency and life quality by enabling a wide range of applications, such as smart homes, virtual reality, elderly monitoring, fire rescue, gesture control, no checkout shopping, security surveillance, and many others.

Bio—Hongfei Xue is a final-year Ph.D. candidate in the Department of Computer Science and Engineering at the State University of New York at Buffalo (UB), under co-supervision of Prof. Lu Su and Prof. Aidong Zhang. Before that, he received his B.Eng. in Computer Science from University of Science and Technology of China (USTC). His research interests lie in the intersection of Internet of Things (IoT) and Machine Learning, with a current emphasis on building the intelligent wireless IoT sensing systems. The primary goal of his research is to develop algorithms and systems that can intelligently collect, integrate, analyze and eventually transform the IoT sensory data generated by the ubiquitous human and physical sensors into useful knowledge that can draw a better understanding of the social and physical world. His research work has been published in various top venues such as MobiCom, MobiSys, SenSys, MobiHoc, UbiComp, and IJCAI.

When: Thursday, **2 March 2023, 9:45 - 10:45**
Where: **Room 3316E Patrick F. Taylor Hall**
Info: `https://www.lsu.edu/eng/ece/seminar`