南京理工大学
NANJING UNIVERSITY OF SCIENCE & TECHNOLOGY

海外学术报告

Network Resource Management in Wireless Networked Control Systems

报告人：

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美国圣母大学教授 IEEE Fellow

报告人简介：

X. Sharon Hu is a professor in the department of Computer Science and Engineering at the University of Notre Dame, USA. Her research interests include low-power system design, circuit and architecture design with emerging technologies, hardware/software co-design and real-time embedded systems. She has published more than 300 papers in these areas. Some of her recognitions include the Best Paper Award from the Design Automation Conference and from the ACM/IEEE International Symposium on Low Power Electronics and Design, and the NSF CAREER award. She has participated in several large industry and government sponsored center-level projects and is a theme leader in an NSF/SRC E2CDA project. She was the General Chair of Design Automation Conference in 2018 and was the TPC chair of DAC in 2015. She also served as Associate Editor for IEEE Transactions on VLSI, ACM Transactions on Design Automation of Electronic Systems, etc. and is an Associate Editor of ACM Transactions on Cyber-Physical Systems. X. Sharon Hu is a Fellow of the IEEE.

报告时间

2018年10月11日
下午3:30

报告地点

计算机学院
4001会议室

主办单位

计算机学院
国交院

报告内容简介：

Wireless networked control systems (WNCSs) are fundamental to many Internet-of-Things (IoT) applications and must work under real-time constraints in order to ensure timely collection of environmental data and proper delivery of control decisions. The Quality of Service (QoS) offered by a WNCS is thus often measured by how well it satisfies the end-to-end deadlines of the real-time tasks executed in the WNCS. Network resource management in WNCSs plays a critical role in achieving the desired QoS. Unexpected internal and external disturbances that may appear in WNCSs concurrently make resource management inherently challenging. The explosive growth of IoT applications especially in terms of their scale and complexity further exacerbate the level of difficulty in network resource management.

In this talk, I first give a general introduction of WNCSs and the challenges that they present to network resource management. In particular, I will discuss the complications due to external disturbances and the need for dynamic and distributed data-link layer scheduling. I then elaborate several of our recent works that aim at addressing this need. Our proposed approaches start with a centralized dynamic approach for minimizing the number of dropped packets. An improved approach balances the scheduling effort between a gateway (or access points) and the rest of the nodes to reduce communication cost. Finally a fully decentralized and dynamic approach accomplishes scalable network resource management with extremely fast response to handle disturbances. Experimental implementation on a wireless test bed validates the applicability of our proposed technique

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海外学术报告

Intelligent Computing, Big Data, and Modern Medicine and Health Care

报告人：

陈子仪（Danny Ziyi Chen）美国圣母大学教授

IEEE Fellow and ACM Distinguished Scientist

报告人简介：

Dr. Danny Ziyi Chen (陈子仪) received the B.S. degrees in Computer Science and in Mathematics from the University of San Francisco, California, USA in 1985, and the M.S. and Ph.D. degrees in Computer Science from Purdue University, West Lafayette, Indiana, USA in 1988 and 1992, respectively. He has been on the faculty of the Department of Computer Science and Engineering, the University of Notre Dame, Indiana, USA since 1992, and is currently a Professor. Dr. Chen's main research interests are in computational biomedicine, biomedical imaging, computational geometry, algorithms and data structures, machine learning, data mining, and VLSI. He has published over 130 journal papers and over 200 peer-reviewed conference papers in these areas, and holds 5 US patents for technology development in computer science and engineering and biomedical applications. He received the CAREER Award of the US National Science Foundation (NSF) in 1996, a Laureate Award in the 2011 Computerworld Honors Program for developing "Arc-Modulated Radiation Therapy" (a new radiation cancer treatment approach), and the 2017 PNAS Cozzarelli Prize of the US National Academy of Sciences. He is a Fellow of IEEE and a Distinguished Scientist of ACM.

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计算机学院
国交院

报告内容简介：

Computer technology plays a crucial role in modern medicine, health care, and life sciences, especially in medical imaging, human genome study, clinical diagnosis and prognosis, treatment planning and optimization, treatment response evaluation and monitoring, and medical data management and analysis. As computer technology rapidly evolves, computer science solutions will inevitably become an integral part of modern medicine and health care. Computational research and applications on modeling, formulating, solving, and analyzing core problems in medicine and health care are not only critical, but are actually indispensable!

Recently emerging deep learning (DL) techniques have achieved remarkably high quality results for many computer vision tasks, such as image classification, object detection, and semantic segmentation, largely outperforming traditional image processing methods. In this talk, we first discuss some development trends in the area of intelligent medicine and health care. We then present new approaches based on DL techniques for solving a set of medical imaging problems, such as segmentation and analysis of glial cells, analysis of the relations between glial cells and brain tumors, segmentation of neuron cells, and new training strategies for deep learning using sparsely annotated medical image data. We develop new deep learning models, based on fully convolutional networks (FCN), recurrent neural networks (RNN), and active learning, to effectively tackle the target medical imaging problems. For example, we combine FCN and RNN for 3D biomedical image segmentation; we propose a new complete bipartite network model for neuron cell segmentation. Further, we show that simply applying DL techniques alone is often insufficient to solve medical imaging problems. Hence, we construct other new methods to complement and work with DL techniques. For example, we devise a new cell cutting method based on k-terminal cut in geometric graphs, which complements the voxel-level segmentation of FCN to produce object-level segmentation of 3D glial cells. We show how to combine a set of FCNs with an approximation algorithm for the maximum k-set cover problem to form a new training strategy that takes significantly less annotation data. A key point we make is that DL is often used as one main step in our approaches, which is complemented by other main steps. We also show experimental data and results to illustrate the practical applications of our new DL approaches.