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Machine Learning for Optimization in Dense Wireless Networks

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Date and Time: Friday, 29 March 2019, 4:30pm – 5:30pm

Venue: Room **CD634**, Hong Kong Polytechnic University
Reception starts at 4:15pm
(Language: **English**)

Abstract

The upcoming 5G embraces network densification as a key enabling technology to meet the ever-increasing demand in capacity. With more and more radio access points, tremendous burdens will be put on the algorithmic aspect of wireless communications. In particular, computationally efficient algorithms are needed for solving various high-dimensional, typically non-convex, resource allocation problems in wireless dense networks (DenseNets). Meanwhile, we have recently witnessed the success of applying machine learning techniques to different application domains, including solving optimization problems. This talk will present a machine learning based framework for mixed-integer resource allocation problems in DenseNets, named *Learn to Optimize for Resource Allocation (LORA)*. Compared with existing studies on "learning to optimize" for wireless networks, LORA requires much fewer training samples; it is capable of transferring to a new network setting with a few additional unlabeled samples; it can outperform sub-optimal algorithms that are used to generate training samples.

About the Speaker

Dr. Jun Zhang received the Ph.D. degree in Electrical and Computer Engineering from the University of Texas at Austin. He is currently an Assistant Professor in the Department of Electronic and Information Engineering at the Hong Kong Polytechnic University. His research interests include wireless communications and networking, mobile edge computing and edge learning, distributed learning and optimization, and big data analytics.

Dr. Zhang co-authored the book *Fundamentals of LTE* (Prentice-Hall, 2010). He is a co-recipient of several best paper awards, including the 2016 Marconi Prize Paper Award in Wireless Communications (the best paper award of IEEE Transactions on Wireless Communications), the 2014 Best Paper Award for the EURASIP Journal on Advances in Signal Processing, an IEEE GLOBECOM Best Paper Award in 2017, an IEEE ICC Best Paper Award in 2016, and an IEEE PIMRC Best Paper Award in 2014. Two papers he co-authored received the Young Author Best Paper Award of the IEEE Signal Processing Society in 2016 and 2018, respectively. He also received the 2016 IEEE ComSoc Asia-Pacific Best Young Researcher Award. He is an Editor of IEEE Transactions on Wireless Communications and Journal of Communications and Information Networks, and was a guest editor of the special section on "Mobile Edge Computing for Wireless Networks" in IEEE Access.

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