



**THE CHINESE UNIVERSITY OF HONG KONG**  
Institute of Network Coding  
and  
Department of Information Engineering  
*Seminar*



**Resource-Constrained Federated Learning with  
Heterogeneous On-Device Models**

by  
**Prof. Dapeng Oliver Wu**  
City University of Hong Kong

**Date : 6 May 2024 (Monday)**

**Time : 10:00am - 11:00am**

**Venue : Rm801, Ho Sin Hang Engineering Building, CUHK**

Abstract

Federated learning enables multiple distributed devices to collaboratively learn a shared prediction model without centralizing their on-device data. Most of the current algorithms require comparable individual efforts for local training with the same structure and size of on-device models, which, however, impedes participation from resource-constrained devices. To cope with heterogeneous devices, we propose a new federated learning framework with heterogeneous on-device models through Zero-shot Knowledge Transfer, called FedZKT. Specifically, FedZKT allows devices to independently determine their on-device models according to their own local resources. This talk presents the design of FedZKT, the effectiveness and robustness of FedZKT towards on-device knowledge agnostic, on-device model heterogeneity, and other challenging federated learning scenarios, such as heterogeneous on-device data and straggler effects.

Biography

Dapeng Oliver Wu received Ph.D. in Electrical and Computer Engineering from Carnegie Mellon University, Pittsburgh, PA, in 2003. Currently, he is Yeung Kin Man Chair Professor of Network Science, at the Department of Computer Science, City University of Hong Kong. His research interests are in the areas of artificial intelligence, communications, image processing, computer vision, signal processing, and biomedical engineering.

He received University of Florida Term Professorship Award in 2017, University of Florida Research Foundation Professorship Award in 2009, AFOSR Young Investigator Program (YIP) Award in 2009, ONR Young Investigator Program (YIP) Award in 2008, NSF CAREER award in 2007, the IEEE Circuits and Systems for Video Technology (CSVT) Transactions Best Paper Award for Year 2001, the Best Paper Award in GLOBECOM 2011, and the Best Paper Award in QShine 2006. He has served as Editor-in-Chief of IEEE Transactions on Network Science and Engineering, and Associate Editor of IEEE Transactions on Communications, IEEE Transactions on Signal and Information Processing over Networks, and IEEE Signal Processing Magazine. He was the founding Editor-in-Chief of Journal of Advances in Multimedia between 2006 and 2008, and an Associate Editor for IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Wireless Communications and IEEE Transactions on Vehicular Technology. He has served as Technical Program Committee (TPC) Chair for IEEE INFOCOM 2012. He was elected as a Distinguished Lecturer by IEEE Vehicular Technology Society in 2016. He is an IEEE Fellow.

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