香港浸會大學
HONG KONG BAPTIST UNIVERSITY

DEPARTMENT OF
COMPUTER SCIENCE
計算機科學系

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2022 SERIES

Department of Computer Science

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Professor and Vice Dean Research
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📅 **Date: 29 November 2022 (Tuesday)**

🕒 **Time: 3:00pm – 4:00pm**

📍 **Venue: WLB205, Shaw Campus**

🖥 **Registration: https://bit.ly/bucs-reg**

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Federated Learning Systems: Towards Effective and Efficient Machine Learning Systems on Data Silos

💬 ABSTRACT

Federated learning has been a hot research area in enabling the collaborative training of machine learning models among different organizations under the privacy restrictions. As researchers try to support more machine learning models with different privacy-preserving approaches, there is a requirement in developing systems and infrastructures to ease the development of various federated learning algorithms. Just like deep learning systems such as Caffe, PyTorch, and Tensorflow that boost the development of deep learning algorithms, federated learning systems are equivalently important, and face challenges from various issues such as unpractical system assumptions, scalability and efficiency. Inspired by federated systems in other fields such as databases and cloud computing, we study the system design requirements for federated learning systems. We find that two important features for federated systems in other fields, i.e., heterogeneity and autonomy, are rarely considered in the existing federated learning systems. In this talk, we will take a systematic comparison among the existing federated learning systems and present our research progress and future system research opportunities and directions.

More details about our research can be found at http://www.comp.nus.edu.sg/~hebs/ and related survey (https://arxiv.org/abs/1907.09693).

✍ BIOGRAPHY

Dr. Bingsheng He is currently a Professor and Vice-Dean (Research) at School of Computing, National University of Singapore. Before that, he was a faculty member in Nanyang Technological University, Singapore (2010-2016), and held a research position in the System Research group of Microsoft Research Asia (2008-2010), where his major research was building high performance cloud computing systems for Microsoft. He got the Bachelor degree in Shanghai Jiao Tong University (1999-2003), and the Ph.D. degree in Hong Kong University of Science & Technology (2003-2008). His current research interests include cloud computing, database systems and high performance computing. He has been a winner for industry faculty awards from Microsoft/NVIDIA/Xilinx/Alibaba. His work also won multiple recognitions as "Best papers" collection or awards in top forums such as SIGMOD 2008, VLDB 2013 (demo), IEEE/ACM ICCAD 2017, PACT 2018, IEEE TPDS 2019, and FPGA 2021. Since 2010, he has (co-)chaired a number of international conferences and workshops, including IEEE CloudCom 2014/2015, BigData Congress 2018 and ICDCS 2020. He has served in editor board of international journals, including IEEE Transactions on Cloud Computing (IEEE TCC), IEEE Transactions on Parallel and Distributed Systems (IEEE TPDS), IEEE Transactions on Knowledge and Data Engineering (TKDE), Springer Journal of Distributed and Parallel Databases (DAPD) and ACM Computing Surveys (CSUR). He is an ACM Distinguished member (class of 2020).