RIT
Center for Human-aware Artificial Intelligence

CHAI Seminar Series

Refreshments will be served.

CHAI

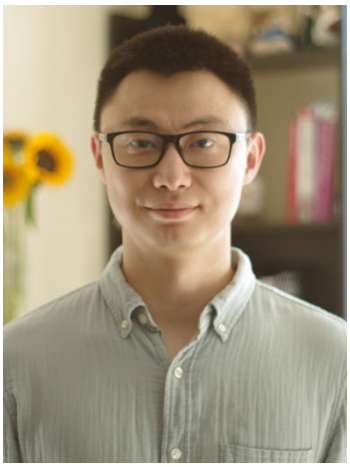
DATE: **Monday, March 27, 2023**

SPEAKER: **Zhiqiang Tao, PhD**
Assistant Professor, School of Information, Golisano College of Computing and Information Sciences

TITLE: **Learning with Hypergradients**

IN PERSON: **Golisano Hall, Room 2400**

ABSTRACT: Hypergradient generally refers to the gradient of a validation loss w.r.t model hyperparameters. While it is usually utilized to maximize prediction performance – like tuning learning rates, dropout, etc., we are also interested in applying hypergradients to enable automated and efficient solutions for a wide range of bilevel problems. Specifically, we define "hyperparameters" adapting to different contexts, and design and develop various hypernetworks to compute/approximate their hypergradients. This talk will introduce our resent research efforts to deploy deep learning models with hypergradients. Particularly, we propose a general gradient-based evolution search framework to solve the traditional hyperparameter optimization (HPO) problem on data augmentations and regularizations, by incorporating hypergradients into the mutation step. The proposed method instantiates a learnable trade-off between local and global HPO solutions. Followed by this work, we further introduce how to leverage hypergradients to realize automated graph neural networks and meta weights for node classification and fair ranking tasks, respectively.



BIO: **Dr. Zhiqiang Tao** is currently a tenure-track Assistant Professor in the School of Information, Golisano College of Computing and Information Sciences, RIT. Prior to this, he was an Assistant Professor in the Department of Computer Science and Engineering at Santa Clara University. He obtained his Ph.D. degree at Northeastern University in 2020, under the supervision of Prof. Yun Fu. Before that, he received his B.E. and M.E. degrees from Tianjin University in 2012 and 2015, respectively. He was a former research intern with Adobe, CA, and Alibaba's DAMO academy, WA. He has published over 40 peer-reviewed papers on leading journals and conferences, including TPAMI, TNNLS, TIP, TCYB, TKDD, NeurIPS, ICLR, KDD, SIGIR, CVPR, ICCV, ECCV, AAAI, IJCAI, ACM MM, CIKM, ICDM, SDM, etc. He serves as the Associate Editor of Neurocomputing and IEEE TCSVT, and he also has served as reviewers and (senior) PC members for prestige journals and international conferences. He won the 3rd place award in KDD Cup AutoML track in 2019. His research interests are machine learning, data mining, and computer vision. His latest projects pursue smart, small, and secure AI by interweaving AutoML, uncertainty modeling, and deep learning.

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