Wenqing Zheng

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Educations

The University of Texas at Austin **Austin, TX, U.S.**
Ph.D. in Electrical and Computer Engineering *Dec. 2020 - present*
Supervisor: Zhangyang (Atlas) Wang

The University of Texas at Austin **Austin, TX, U.S.**
M.Sc. in Electrical and Computer Engineering *Aug. 2018 - Dec. 2020*
Supervisor: Nuria Gonzalez Prelcic

Beijing University of Posts and Telecommunications **Beijing, China**
B.S. in Telecommunications Engineering; GPA: 3.89/4.0 *Sep. 2014 - Jun. 2018*
Ranked 5 out of 565

Internship Experiences

Amazon A9 **Palo Alto, CA**
Applied Science Research Intern *May.2021 – present*
- Cold-start graph embedding learning for recommendation systems: first pretrain a graph model to generate versatile node embeddings using self-supervised learning, then learn a student model that is able to generalize to strict-cold-start nodes.

GEIRI North America **San Jose, CA**
Reinforcement Learning Research Intern *May.2020 – Aug.2020*
- Train a Soft Actor-Critic agent to manage large scale power grid: embed the huge discrete geometric actions into continuous space; using Graph Neural Networks as preprocessing; Monte-Carlo Tree search as efficient exploration.

Research Projects

Transformer controller in Cyber Physical Systems *Jan. 2021 - May. 2021*
- Study the multi-agent control problem under delayed propagation effects in Cyber Physical Systems. Proposed a new transformer that bake the cone-shaped prior into the attention design. Take the traffic signal control as a case study and outperformed SOTA controllers.

Deep/Large Graph Networks Benchmarking *Mar. 2021 - present*
- Extensively compare multiple recently proposed tricks/models for deep/large graph convolutional networks under a unified experimental setting, analyze their performance gains and discover best trick combinations.

Towards more interpretable and Scalable Learning to Optimize *Oct. 2020 - May. 2021*
- Boost the interpretability and the scalability of the learned optimizers by parsing out a symbolic equation from the numerically learned rule. Bridges the world of symbolic and numerical optimization models.

Efficient TCP Congestion Control *Feb. 2021 - present*
- Train a TCP congestion controller with reinforcement learning, then compress it into a lighter-weight and more efficient one.

Vision-Based Decentralized Controller/Beamformer for UAV Swarms *Oct. 2020 - present*
- Control and beamforming for decentralized UAV flocks. Use yolo-v3 as vision feature extractor and graph recurrent network/decentralized transformer as decision maker. The "control" part was elected as one of "the 10 best researches in 2020" by Army Research Lab.

Publications

Wenqing Zheng, Qiangqiang Guo, Hao Yang, Peihao Wang, and Zhangyang Wang. Delayed propagation transformer: A universal computation engine towards practical control in cyber-physical systems. *under review by NeurIPS*, 2021.

Wenqing Zheng, Tianlong Chen, Tingkuei Hu, and Zhangyang Wang. Symbolic learning to optimize: Making optimizer learning more interpretable and scalable. *under review by NeurIPS*, 2021.

Tianlong Cheng, Kaixiong Zhou, Keyu Duan, Wenqing Zheng, Peihao Wang, Xia Hu, and Zhangyang Wang. Bag of tricks for training deeper graph neural networks: A comprehensive benchmark study. *under review by NeurIPS 2021*.

Ting-Kuei Hu, Fernando Gama, Tianlong Chen, Wenqing Zheng, Zhangyang Wang, Alejandro Ribeiro, and Brian M. Sadler. Scalable perception-action-communication loops with convolutional and graph neural networks. *Under Review by TSIPN*.

W Zheng, Anum Ali, N González-Prelcic, RW Heath, Aldebaro Klautau, and E Moradi Pari. 5g v2x communication at millimeter wave: rate maps and use cases. In *2020 IEEE 91st Vehicular Technology Conference (VTC2020-Spring)*, pages 1–5. IEEE, 2020.

Wenqing Zheng and Nuria González-Prelcic. Joint position, orientation and channel estimation in hybrid mmwave mimo systems. In *2019 53rd Asilomar Conference on Signals, Systems, and Computers*, pages 1453–1458. IEEE, 2019.

Yaqian Xu, Wenqing Zheng, Jingchen Qi, and Qi Li. Blind image blur assessment based on markov-constrained fcm and blur entropy. In *2019 ieee international conference on image processing (icip)*, pages 4519–4523. IEEE, 2019.

Hao Yang, Jianan Zhao, Wenqing Zheng, and Jianguo Yu. Large data throughput optimization model with full c order model parallel flow number prediction optical domain. *TELKOMNIKA (Telecommunication Computing Electronics and Control)*, 14(2A):10–17, 2016.

Wenqing Zheng, Wenjun Xu, and et al. A new cyclic cumulants based doppler estimation method in uav channels, 2018.