Wenqing Zheng

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EDUCATION

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.

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 Chen, 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*, 2021.
- **W Zheng** Anum Ali, Nuria 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.
- Yaxian 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. In *Telecommunication Computing Electronics and Control (TELKOMNIKA),* 14(2A): 10-17, 2016
- **Wenqing Zheng**, Wenjun Xu, et al. A New Cyclic Cumulants Based Doppler Estimation Method in UAV Channels. *Chinese Patent.* 2018

RECENT 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.

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.

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.