CHUNHENG JIANG Troy NY, 12180 | http://www.horsehour.com/ | (518) 960-7682 | jiangchunheng@gmail.com

EDUCATION

Rensselaer Polytechnic Institute (RPI), Troy NY, USA
Ph.D. in Computer Science, *Aug 2016 - May 2022 (Expected)*
M.S. in Computer Science, *Aug 2016 - May 2018*

Southwest Jiaotong University, Chengdu, China
M.S. in Applied Mathematics, *Sept 2011 - July 2014*

Tianjin University of Commerce, Tianjin, China
B.S. in Info & Computing Science, *Sept 2005 - July 2009*

WORK EXPERIENCE

IBM Thomas J. Watson Research Center, Yorktown Heights, NY
Research Summer Intern, *June - Aug 2020*

Antusuoji Network Technology Co., Ltd., Chengdu, China
Cofounder & Software Engineer, *July 2014 - Mar 2016*

SKILLS

Languages: Python, Java, C/C++, Matlab, MPI, HTML, Markdown, LaTeX

Operating Systems: Linux, OS X, Windows

Databases: MySQL, SQLite, MongoDB

Softwares: TensorFlow, Keras, Pandas, Scikit-Learn, XGBoost, LightGBM, AWS/EC2, SLURM, Git, bash

COURSES

Advanced Algebra, Probability Theory & Mathematical Statistics, Operational Theory, Numerical Analysis, Differential Equation, Operating Systems, Data Structure, Parallel Computing, Data Mining, Machine Learning from Data, Randomized Algorithms

SELECTED PROJECTS

Aug 2020 - Present: **Dynamical System View of Neural Network Training**, RPI-IBM AIRC | Extern | Python, TensorFlow
- Built a novel graph representation for various neural architectures (e.g., ResNet, DenseNet, MobileNet, VGG, etc.)
- Studied the topological properties (e.g., resilience, shortest path length) of neural architectures for robust models
- Derived approximated training dynamics to speed-up neural network training and neural architecture search (NAS)
- Achieved 10-70% relative improvement over the best baseline w.r.t ranking of neural networks
- **Techniques:** SGD, transfer learning, neural architecture search/design, learning curve prediction

June - Aug 2020: **Acoustic Environment Transfer**, IBM | Research Summer Intern | Python, TensorFlow, Keras, SLURM
- Extended neural style transfer techniques to the synthesis of audio with desired environmental sounds (UrbanSound8K)
- Developed a new metric to evaluate acoustic environment transfer models (e.g., Ulyanov, Mital, VGGish and SoundNet)
- Produced augmented data with diverse environmental sound textures to increase the robustness of audio classifiers
- **Techniques:** AutoEncoder, audio synthesis, audio classification, optimization

Aug 2018 - May 2020: **Inferring True Dynamics from Incomplete Networks**, RPI | Research Assistant | Python, Scikit-Learn
- Developed a mean-field approach to infer nodes' characteristics from incomplete networks
- Recovered true nonlinear dynamics with incomplete topology and equilibrium state information
- Designed a heuristic optimization algorithm based on our topology inference approach to solve K-SUM problem
- Solved large-scale nonlinear dynamical systems in parallel (10x speedup *w/* MPI/SLURM)
- **Techniques:** graph sampling, mean-field, dynamical systems, optimization, parallel computing

May - Aug 2017: **Multi-round Winner Determination**, RPI | Research Assistant | Python, Java, TensorFlow, Keras
- Devised heuristic strategies (sampling, caching, pruning) to efficiently identify all tied winners in voting
- Developed reinforcement learning models to simulate voting procedures and improve the search efficiency
- Reduced run time by 50-80% relative to the baseline strategies
- **Techniques:** Sampling, pruning, DFS, reinforcement learning, optimization, voting

SELECTED PUBLICATIONS

Chunheng Jiang, Tejaswini Pedapati, Pin-Yu Chen, Yizhou Sun, Jianxi Gao. Neural Capacitance: A New Perspective of Neural Network Selection via Edge Dynamics. *arXiv preprint arXiv:2201.04194*, 2022

Chunheng Jiang, Boleslaw Szymanski, Jie Lian, Shlomo Havlin, and Jianxi Gao. Nuclear Reaction Network Unveils Novel Reaction Patterns Based on Stellar Energies. *New Journal of Physics*, 2021

Xiang Niu, **Chunheng Jiang**, Jianxi Gao, Gyorgy Korniss, and Boleslaw Szymanski. From Data to Complex Network Control of Airline Flight Delays. *Scientific Reports*, 11 (18715), 2021

Xiang Niu, Christopher Brissette, **Chunheng Jiang**, Jianxi Gao, Gyorgy Korniss, Boleslaw K. Szymanski. Heuristic Assessment of Choices for Risk Network Control. *Scientific Reports*, 11 (7645), 2021

Chunheng Jiang, Jae-wook Ahn and Nirmit Desai. Acoustic Environment Transfer for Distributed Systems. In *SEC-2020: The 5th IEEE/ACM Symposium on Edge Computing*, IEEE, 2020

Chunheng Jiang, Jianxi Gao, and Malik Magdon-Ismail. Inferring Degrees from Incomplete Networks and Nonlinear Dynamics. In *Proceedings of the 29th International Joint Conference on Artificial Intelligence*, 2020

Chunheng Jiang, Jianxi Gao and Malik Magdon-Ismail. True Nonlinear Dynamics from Incomplete Networks. In *Proceedings of 34th AAAI Conference on Artificial Intelligence*, 2020

Jun Wang, Sujoy Sikdar, Tyler Shepherd, Zhibing Zhao, **Chunheng Jiang** and Lirong Xia. Practical Algorithms for Multi-Stage Voting Rules with Parallel Universes Tiebreaking. In *Proceedings of 33rd AAAI Conference on Artificial Intelligence*, 2019

Chunheng Jiang, Sujoy Sikdar, Jun Wang, Lirong Xia, and Zhibing Zhao. Practical Algorithms for Computing STV and Other Multi-Round Voting Rules. In *EXPLORE-2017: The 4th Workshop on Exploring Beyond the Worst Case in Computational Social Choice*, 2017