

# CHUNHENG JIANG

Troy NY, 12180 ◊ (518) 960-7682 ◊ jiangchunheng@gmail.com ◊ linkedin.com/in/jiangch

## EDUCATION

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

## WORK EXPERIENCE

**Research Summer Intern**, IBM Thomas J. Watson Research Center, Yorktown Heights, NY Jun 2020 – Aug 2020  
– Extended neural style transfer techniques to the synthesis of audio with desired environmental sounds  
– Developed a new metric to evaluate various backbone neural models (i.e., Ulyanov, Mital, VGGish and SoundNet)  
– Generated augmented data with diverse environmental sound textures to increase the robustness of audio classifiers  
☆ *Related Skills: AutoEncoder, Style Transfer, Audio Classification, FFT, Griffin-Lim Algorithm, Data Augmentation*

**Software Engineer**, Antusuoji Network Technology Co., Ltd., Chengdu, China Jul 2014 – Mar 2016

## SELECTED PROJECTS

**Dynamical System View of Neural Network Training** // Research Extern, RPI-IBM AIRC Aug 2020 – Present  
– Built a novel graph representation for various neural architectures (e.g., ResNet, DenseNet, MobileNet, VGG, etc.)  
– Derived approximated training dynamics to speed-up neural network training and neural architecture search  
– Identified predictive graph measures (e.g., resilience, shortest path length) of neural architectures' performance  
– Achieved 10 ~ 70% relative improvement over the best baseline w.r.t ranking of neural networks  
☆ *Related Skills: SGD, Transfer Learning, Neural Architecture Search (NAS), Learning Curve Prediction*

**Mean-Field Approaches for Network Inference** // Research Assistant, RPI Aug 2018 – May 2020  
– Developed a set of mean-field approaches to infer various incomplete networks (e.g., social, ecology, epidemic, etc.)  
– Recovered true nonlinear dynamics and full nodal degrees 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 (10× speedup w/MPI/SLURM)  
☆ *Related Skills: Graph Sampling, Link Prediction, Mean-Field Approximation, Optimization, Parallel Computing*

**Multi-round Winner Determination** // Research Assistant, RPI May 2017 – Aug 2017  
– 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 DFS approach  
☆ *Related Skills: Voting, DFS, Pruning, Priority Queue, Reinforcement Learning (RL)*

## SELECTED PUBLICATIONS

(See full list on Google Scholar)

**Jiang, C.**, Pedapati, T., Chen, P.-Y., Sun, Y. & Gao, J. Neural Capacitance: A new perspective of neural network selection via edge dynamics. Preprint at <https://arxiv.org/abs/2201.04194> (2022) **Submitted: ICML 2022 & Joint Patent**

**Jiang, C.**, Gao, J. & Magdon-Ismail, M. True nonlinear dynamics from incomplete networks. In *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 34, 131 – 138 (AAAI, 2020) **Oral: 4.5% of 7,737**

**Jiang, C.**, Gao, J. & Magdon-Ismail, M. Inferring degrees from incomplete networks and nonlinear dynamics. In *Proceedings of the 29th International Joint Conference on Artificial Intelligence*, 3307 – 3313 (IJCAI, 2020) **Oral: 12.6% of 4,717**

Wang, J., Sikdar, S., Shepherd, T., Zhao, Z., **Jiang, C.** & Xia L. Practical algorithms for multi-stage voting rules with parallel universes tiebreaking. In *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 33, 2189 – 2196 (AAAI, 2019)

## SERVICE TO PROFESSION

Reviewer for ICML, WWW, Complex Networks (since 2018), NetSci, NERCCS

## SKILLS

Python, Java, C/C++, Matlab, MPI, HTML, L<sup>A</sup>T<sub>E</sub>X, Markdown // TensorFlow, PyTorch, Keras, Pandas, Scikit-Learn, XGBoost, LightGBM, SLURM, Git // MySQL, SQLite, MongoDB // Matplotlib, TikZ, NetworkX, D3.js