

CHUNHENG JIANG

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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

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^AT_EX, Markdown // TensorFlow, PyTorch, Keras, Pandas, Scikit-Learn, XGBoost, LightGBM, SLURM, Git // MySQL, SQLite, MongoDB // Matplotlib, TikZ, NetworkX, D3.js