Jianyi Yang

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EDUCATION

University of California, Riverside — Riverside, CA
Ph.D. Candidate in Electrical Engineering. Advisor: Shaolei Ren. — *Sept. 2018 – Present*
GPA:4.0/4.0, Selected courses: Convex Optimization, Pattern Recognition, Deep Learning

Beijing University of Posts and Telecommunications — Beijing, China
M.S. in Information and Telecommunication Engineering. Advisor: Lin Sang. — *Sept. 2015 – Mar. 2018*
GPA: 86.29/100, Outstanding Graduate Student

Xidian University — Xi'an, Shaanxi, China
B.E. in Information Engineering — *Sept. 2011 – Jun. 2015*
GPA 88.76/100, ranking: 1/153, Graduate with Merit

RESEARCH INTERESTS

Domain Knowledge Informed Learning: Understand the widely-used informed learning in theory and motivate provable informed learning frameworks.

Contextual Bandit Learning: Develop sequentially decision making algorithms for practical settings with provable performance guarantee, especially for the adversarial settings.

EXPERIENCE

Research Assistant — June 2019 – Present
University of California, Riverside — *Riverside, CA*
- Developed and analyzed several contextual bandit algorithms including MaxMinUCB and MinWD.
- Analyzed the convergence and generalization of knowledge informed training framework.
- Empirically Measured the contribution of domain knowledge by Shapley value.

Teaching Assistant: EECS 120A Logic Design — Sep. 2019 – Dec. 2019
University of California, Riverside — *Riverside, CA*
- Guide the FPGA experiments and Verilog Simulations.

PUBLICATIONS

∗ means equal contribution.

J. Yang and S. Ren, **Robust Bandit Learning with Imperfect Context**, AAAI Conference on Artificial Intelligence (**AAAI**),2021.

J. Yang and S. Ren, **Bandit Learning with Predicted Context: Regret Analysis and Selective Context Query**, IEEE International Conference on Computer Communications (**INFOCOM**), 2021.

L. Yang*, J. Yang*, and S. Ren, **Multi-Feedback Bandit Learning with Probabilistic Contexts**, International Joint Conference on Artificial Intelligence (**IJCAI**), 2020.

B. Lu*, J. Yang*, L. Y. Chen, and S. Ren, **Automating Deep Neural Network Model Selection for Edge Inference**, IEEE International Conference on Cognitive Machine Intelligence (**CogMI**), 2019.

Z. Shao, J. Yang, and S. Ren, **Increasing Trustworthiness of Deep Neural Networks via Accuracy Monitoring**, AI Safety Workshop (co-located with IJCAI), 2020.

Z. Cheng, J. Yang, Z. Wei, H. Yang, **User Clustering and Scheduling in UAV Systems Exploiting Channel Correlation**, IEEE Annual International Symposium on Personal, Indoor and Mobile Radio Communications (**PIMRC**)), 2019.

J. Yang, Z. Wei, X. Zhang, N. Li and L. Sang, **Correlation Based Adaptive Compressed Sensing for Millimeter Wave Channel Estimation**, IEEE Wireless Communications and Networking Conference (**WCNC**), 2017.

J. Yang, Z. Wei, N. Li, L. Sang and P. Li, **Enhanced Multi-Resolution Hierarchical Codebook Design for Adaptive Compressed Sensing Based Millimeter Wave Channel Estimation**, IEEE/CIC International Conference on Communications in China (**ICCC**), 2016.

Selected Projects

Understanding Informed Machine Learning Sep. 2020 – Present
- Focus on understanding the framework of domain knowledge informed training.
- Proved the condition where informed training based on DNN can converge.
- Proved the generalization bound of informed learning by Neural Tangent Kernel(NTK) and derived the sampling complexity.
- Analyzed the balance of domain knowledge integration and labeled samples when labels are scarce and knowledge is imperfect.
- A paper on this work has been submitted for review.

Robust Bandit Learning Under Imperfect Predicted Context Dec. 2018 – Present
- Formulated the contextual bandit problem under context imperfectness which is motivated from the practical cases where contexts are usually predicted based on history.
- Proved the regret bound of Thompson Sampling under the context imperfectness setting.Based on the regret bound of Thompson Sampling, developed the selective context query algorithm when context query is available. A paper on this work will appear in INFOCOM-21.
- Proposed two robustness objectives under the context imperfectness setting and two corresponding robust bandit algorithms– MaxMinUCB and MinWD. Bounded the regret and reward of the two proposed algorithms theoretically. A paper on this work is published in AAAI-21.

Measuring the value of Domain Knowledge Sep. 2019 – Nov. 2019
- Proposed the method to measure the quantitative value of domain knowledge based on Shapley value–a provable method in Game theory.
- Measured the value of logic knowledge for semantic loss based deep learning. Performed experiments by Tensorflow on Cifar-10 and MINIST datasets. A preprint https://arxiv.org/abs/2011.08450 on this work is completed.

5G Channel Estimation Sep. 2015 – Mar. 2018
- Proposed a provable codebook design for compressed-sensing-based milimeter-wave channel estimation. A paper on this work is published in IEEE ICCC-2016.
- Proposed correlation based adaptive compressed sensing algorithm for milimeter-wave channel estimation. A paper on this work is published in IEEE WCNC-2017.

Technical Skills

Languages: Python, Matlab, Verilog for FPGA
Platforms:Tensorflow, Pytorch

Awards

Deans Distinguished Fellowship, UCR	2018
National Graduate Scholarship, Ministry of Edu. of P.R.China	2017
Goodix Scholarship, GOODIX Technology INC & XDU	2015
National Scholarship, Ministry of Edu. of P.R.China	2013
National Scholarship, Ministry of Edu. of P.R.China	2012