QINGQI ZHANG

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EDUCATION

Zhejiang University, **College of Computer Science and Technology**, Hangzhou Sep. 2018 - present

- **Zhejiang University Morningside Cultural China Scholar** (36 selected from 12,000)
- Chu Kochen Honors College member (700 selected from 6,400)
- B.Eng. in Computer Science and Technology, expected in June 2022
- Major GPA: 3.98/4.00 (92.7/100) (top 3% out of 290)
- Mathematical courses: Introductory Lectures on Optimization (95), Probability theory, Mathematical Statistics (93), Regression Analysis (99), Ordinary differential equation (96), Real Variable Analysis (99), Stochastic Process (92), Multivariate Statistical Analysis

RESEARCH INTERESTS

machine learning, generalization and explainability of deep nets, robust machine learning, optimization for ML, reinforcement learning and control

HONORS & AWARDS

- Chu Kochen Honors College Scholarship for Top Students (20 out of 2000) 2021
- Zhejiang Provincial Scholarship (top 2%) 2021
- First Class Scholarship for Outstanding Merit (top 3%) 2021
- Gold Medal, The 2019 ICPC Asia-East Continent Final (10th place among 380) 2019
- Gold Medal, The 2019 ICPC Asia Regional Contest (twice, 2nd and 3rd place among 300) 2019

EXPERIENCE

MIT-IBM Watson AI Lab | IBM | Research Affiliate Jul. 2021 - present

Advisor: Research Staff Member and Manager Jie Chen

- Extended the application of the Contrastive Explanation Method (CEM) to explain the decisions of graph neural networks for node classification task (CEM-G), using PP/PN features, PP/PN edges
- Used the FISTA and Adam methods to implement CEM-G based on Pytorch-geometry, found that Adam converges more smoothly
- Solved the problem of the unreasonable distribution of PP features in the graph by using a proper selection criterion
- Analyzed the optimization process, and found the reason why the abnormally large learning rate is optimal
- Explained the GNN's prediction for one node based on PP/PN features, compared the explanation with MLP's, and found three possible reasons for GNN to make mistakes

School of Mathematical Sciences | Zhejiang University | Assistant Feb. 2021 - May. 2021

Advisor: Professor Peng Zhang

- Attempted to develop a novel lossless data compression scheme with a higher compression ratio
- Studied the principles and methods of lossless and lossy data compression
- Raised potential problems of the lab's original approach which uses polynomial bases and dense reference points, conducted experiments using the k-means algorithm to verify the conjecture
- Proposed to apply machine learning algorithms to more accurately capture the data structure (e.g. conditional probability distribution)
- Participated in developing novel compression algorithms based on deep models (such as LSTM), balanced speed and compression ratio, contributed to an IT company's large-scale data backup

Zhejiang University ICPC Team | Zhejiang University | Team Leader Jul. 2018 - Jul. 2020

Coach: Associate Professor Can Wang

- Attended 84 online contests and 3 ICPC training camps, learned algorithms about data structure, string processing, computational geometry, graph theory and randomization, etc.
- Coordinated the team's training sessions and helped to improve the strategies for the contests
- Served as a major coder and algorithm designer in the team during competitions

Online Course Project | Massachusetts Institute of Technology | Team Leader Aug. 2020

Advisor: Professor Suvrit Sra

- Developed a roadmap to detect Covid-19 positive cases from the COVID-19 Chest X-Ray dataset (only 700 samples)
- Adopted preprocessing techniques such as lung segmentation and histogram equalization
- Selected the VGG16 neural network and pretrained the model using other X-Ray images
- Used the Grad-CAM method to visualize and justify the prediction

- Achieved a detection accuracy of 75% in the dataset

ADDITIONAL INFORMATION

Computer & Programming: python, C++, C, java, R, MATLAB, SQL, LaTeX, shell; Linux
Interests: Chinese philosophy, Chinese poetry, playing Go (Amateurish Level-4), playing the piano (Level-8 certificate), cycling