WANRU ZHAO

+86 188-100-10893 ⋄ zhaowrenee@gmail.com ⋄ https://github.com/Ryan0v0
Dayuncun, No.29 Zhichun Road, Haidian District, Beijing, 100191 China

EDUCATION

Beihang University (BUAA), Beijing, China Sept. 2017 - Jul. 2021
B.S. in School of Computer Science and Engineering
GPA: 89.8/100 (3.75/4.0) Rank: Top 10%

University of Cambridge, Cambridge, United Kingdom Jul. 2018 - Aug. 2018
Summer school visiting scholar in Downing College
GPA: 4.0/4.0

WORKING EXPERIENCE

Applied Scientist Intern, Software Development Engineer Intern Jan. 2021 - Present
***Amazon Web Services**, Shanghai, China* *Mentors: Minjie Wang*

- Working in **AWS AI Lab Shanghai** to do research and development of **Deep Graph Library (DGL)**.
- Ongoing project of Graph Neural Network interpretability based on visualization for enormous graph data.
- Engaging with real customers, designing models and algorithms for specific application scenarios (recommender system, anti-fraud, etc.). Maintaining open source projects and contributing to communitites.

Algorithm Engineer Intern Mar. 2020 - Oct. 2020
***SenseTime Research**, Beijing, China* *Mentors: Ruihao Gong, Fengwei Yu*

- Worked in **Link and Compile Group (LCG)** to develop a deep learning core engine with System+AI techniques.
- Improved Quantization Aware Training (QAT) Algorithm through quantizing the input, weight, and gradient of NN to 8 bits, which speed up the forward and backward propagation process 1.6 to 1.9 times and shorten the training time of convolutional neural network by 22%.
- Implemented a Pytorch-ONNX-Caffe conversion and profiling package which supports all neural layers and effectively bridges the gap between research teams (model training) and engineering teams (model deployment).
- Designed modularized APIs of Post Training Quantization (PTQ) that successfully worked with downstream task models within a wide variety such as Pedestrian Attribute Recognition and Intelligent Transportation.

RESEARCH EXPERIENCE

AI-Enabled Visualization and Analytics Platform Development Jul. 2020 - Sept. 2020
*Remote Visiting Scholar at **the University of Notre Dame*** *Advisor: Prof. Chaoli Wang*

- Participated in an independent research on the topic of AI-enabled visualization and analytics project for analyzing and understanding a wide variety of data and models.
- Utilized self-supervised learning algorithm based on contrastive learning of visual representation and trained convolutional NN using 100,000 unlabeled videos by PyTorch, TensorFlow.
- Planning to submit a paper on this research to IEEE Visualization Visual Analytics (VIS), 2021.

Traffic Task Assignment and Pricing in Spatial Crowdsourcing Apr. 2019 - Sept. 2020
*Research Assistant at **Big Data Analysis Group, Beihang University*** *Advisor: Prof. Yongxin Tong*

- Explored the source code and application scenarios of MADlib in Greenplum Database, a massively parallel data platform based on PostgreSQL for ease of use and portability.
- Used Spark and Hadoop to analyze the daily order data from 2017 to 2019 in Beijing provided by **Didi Chuxing Technology Co.**. Used WebGL, D3.js and Leaflet for visualization.
- Designed a matching based dynamic pricing strategy maximum based on weighted bipartite matching algorithm using probabilistic bipartite graph and Upper Confidence Bound(UCB), a technique for Multi-Armed Bandit problem, to boost the estimation of acceptance ratios.

Graph Attention Based Proposal 3D ConvNets for Action Detection Jun. 2019 - Oct. 2020
Research Assistant at ***State Key Laboratory, Beihang University***

- Surveyed 3DCNNs and GCN; conducted experiments on two proposal 3D ConvNets based models (P-C3D and P-ResNet) and two popular action detection benchmarks (THUMOS 2014, ActivityNet v1.3).
- Embeded our module in P-C3D and achieved average mAP 3.7% improvement on THUMOS 2014 dataset.
- Wrote the paper. The paper is accepted by AAAI 2020. [Poster]

Individual Tutoring System for Piano Training based on AR+AI Oct. 2019 - Nov. 2020
Researcher at ***State Key Laboratory of Virtual Reality, Beijing, China***

- Presented an AR-based piano performance training system, which supports better user experience with significantly less cognitive load and increases learning efficiency and quality compared to traditional teaching patterns.
- Implemented Viterbi Algorithm in machine learning through pre-trained Hidden Markov Model to determine appropriate fingerings for specific notes and note sequences.
- Generated 3D animation of hand motion automatically based on the determined fingerings. These virtual hand demonstrations are rendered in head-mounted displays and registered with a real piano to provide users with real-time visual guidance and feedback. [Demo]
- Submitted a paper to IEEE VR 2021 and it is under review.

PUBLICATION

J. Li, X. Liu, Z. Zong, **W. Zhao** et.al. Graph Attention based Proposal 3D ConvNets for Action Detection. In AAAI 2020.
R. Guo, J. Cui, **W. Zhao** et.al. Hand-by-Hand Mentor: An AR based Training System for Piano Performance. In IEEE VR 2021 (Under Review).

SKILLS

Collaboration Software: Git/Bitbucket, SVN, Jira, Confluence
Programming Skills: C/C++, Java, Python, SQL, R, Matlab, Verilog HDL, Mips Assembly, x86 Assembly
Machine Learning: TensorFlow, PyTorch, Caffe, ONNX
Visualization: OpenGL, GLSL, WebGL, D3.js
Big Data: Spark, Hadoop, Hive, HBase

HONORS AND AWARDS

National Grand Prize, China Competition on Virtual Reality (2020) [Demo]	Sept. 2020
*Global Top **3%***, Google Code Jam to I/O for Women (2020)	Mar. 2020
Participant, Google Machine Learning Winter Camp [Poster] [Slides] [Code] [Demo]	Jan. 2020
*First Prize(**0.6%**)*, Chinese Undergraduate Mathematical Contest in Modeling (CUMCM) [Code]	Sept. 2019
Honorable Prize, COMAP's Mathematical Contest in Modeling (MCM) [Code]	Mar. 2020
Bronze Medal(Total Rank 80), China Collegiate Programming Contest (CCPC)	Oct. 2019
Bronze Medal, ACM International Collegiate Programming Contest (ACM-ICPC)	Jun. 2019
Silver Medal(Total Rank 16), China Collegiate Programming Contest (CCPC) - WomenFinal	Jun. 2018
Bronze Medal, CCF National Olympiad in Informatics (NOI)	Jul. 2016
Grand Prize, Scholarship for Academic Records of Beihang University	Nov. 2020
Scholarship for *Role Model in Shi'e College(**3%**)* of Beihang University	Oct. 2019

EXTRACURRICULAR ACTIVITIES

Member of technology department of Microsoft Student Club (MSC) in BUAA.
Member of Innovation and Entrepreneurship Center in Beihang University Student Union: Organized Workshops.
Member of Public Relations Department in Beihang University Student Union: Sought for sponsorship of ¥6,000.