Zixian Ma

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EDUCATION

Stanford University
BS with Honors and MS in Computer Science; Minor in Biology; GPA: 3.97 *9/2018 – 6/2022*
Courses: Artificial Intelligence: Principles and Techniques, Machine Learning, Natural Language Understanding, From Languages to Information, Convolutional Neural Network for Visual Recognition, Reinforcement Learning, Machine Learning with Graphs, Introduction to Human-Computer Interaction Design, Web Applications, Virtual People

PUBLICATIONS

CREPE: Can Foundation Vision-Language Models Reason Compositionally? *2022*
Zixian Ma*, Jerry Hong*, Mustafa Omer Gul*, Mona Gandhi, Irena Gao, Ranjay Krishna
The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2023) (Highlight)

ELIGN: Expectation Alignment as a Multi-Agent Intrinsic Reward *2022*
Zixian Ma, Rose E. Wang, Li Fei-Fei, Michael Bernstein, Ranjay Krishna
The Thirty-Sixth Annual Conference on Neural Information Processing Systems (NeurIPS 2022)

Model Sketching: Centering Concepts in Early-Stage Machine Learning Model Design *2022*
Michelle Lam, **Zixian Ma,** Anne Li, Izequiel Freitas, Dakuo Wang, James Landay, Michael Bernstein
The ACM CHI Conference on Human Factors in Computing Systems (CHI 2023)

OpenAttack: An Open-source Textual Adversarial Attack Toolkit *2021*
Guoyang Zeng, Fanchao Qi, Qianrui Zhou, Tingji Zhang, **Zixian Ma**, Bairu Hou, Yuan Zang, Zhiyuan Liu, Maosong Sun
The Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL 2021): System Demonstrations

RESEARCH EXPERIENCE

Stanford Vision and Learning Lab *4/2020 – 6/2022*
Mentors: Prof. Li Fei-Fei, Dr. Ranjay Krishna (now Prof. Ranjay Krishna at University of Washington)
- Led an independent multi-agent collaboration project under the multi-agent reinforcement learning framework
- Formulated and implemented a novel multi-agent intrinsic reward ELIGN that incentivizes expectation alignment
- Conducted extensive experiments across 6 collaborative and competitive tasks in 2 multi-agent environments
- Wrote a full paper on the multi-agent intrinsic reward ELIGN, which got accepted to NeurIPS 2022

Stanford Human-Computer Interaction Group *4/2022 – 9/2022*
Mentors: Prof. Michael Bernstein, Prof. James Landay
- Worked on the ModelSketching project advised by Profs. Michael Bernstein and James Landay (accepted to CHI 23)
- Wrote Python functions in the ModelSketchBook API for users to compare multimodal concepts with CLIP
- Evaluated the utility of model sketches in surfacing reviewers' biases on a manually collected food reviews dataset
- Conducted pilot and final user studies on the hateful memes detection task

Tsinghua Natural Language Processing Lab *1/2021 – 6/2021*
Mentors: Prof. Zhiyuan Liu, Dr. Fanqi Chao
- Reviewed literature on existing adversarial attacks to NLP models and defenses against them
- Contributed to the open-source Python toolkit OpenAttack for streamlining textual adversarial attacks
- Reproduced adversarial attacks, including BERT-ATTACK and BAE, to BERT and evaluated BERT's performance
- Added multilingual support for transformers

WORK EXPERIENCE

Google Research – *Research Intern* *8/2022 – 11/2022*
- Evaluated the zero-shot and few-shot performance of foundation language models LaMDA (128B) and PaLM (540B) on screen navigation tasks with various prompt designs, including chain-of-thought prompts
- Implemented prompt tuning and visual prefix tuning on top of transformers-based language models
- Finetuned LaMDA with prompt-tuning techniques and vision-language model CoCa on the realistic MoTIF dataset
- Achieved STOA results and submitting this work to a conference

Facebook (currently Meta) – *Software Engineering Intern* *6/2021 – 8/2021*
- Built and optimized multi-task multi-label models for stories ranking with multi-gate mixture of experts module
- Launched the models into production and reduced the company's multi-feed CPU usage by 0.6% ($191,746)

IBM China Development Lab – *Algorithm Engineering Intern* *6/2019 – 8/2019*
- Improved the confidence of the classification algorithm by 20~30% using transfer learning
- Optimized the edge detection algorithm in the BMW automobile project, and reduced inference time by half

AWARDS

Research

The Firestone Medal for Excellence in Undergraduate Research *2022*
- Awarded to the top 10 percent of Honors Theses across all disciplines and schools at Stanford each year

The Ben Wegbreit Prize for Undergraduate CS Research *2022*
- The CS Department's Best Honors Thesis award

Hackathon

Sponsor Prize Winner @ TreeHacks *2019*
- Built a web application with WixCode to connect students for shared rides between the airport and Stanford campus

Best Overall Prize @ Hackoverflow by WiCS *2019*
- Built a chatbot *Taylor* with Google's Dialogflow to provide medical and mental resources to sexual assault victims

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

Head Academic Lead @ BioX (a summer camp for high school students based in Shanghai, China) *2019 – 2021*
- TAed 24 high school students in Introduction to Bioinformatics and Computational Biology in 2019; designed and led the same course with three professors and three other student TAs in 2020; Co-organized BioX in 2021

Student Founder and Organizer @ Stanford Existential Risks Initiative (SERI) *2021*
- Co-founded SERI with two professors and other students; organized the first summer research program

Member @ She++ *2018 - 2019*
- Matched marginalized high school students, especially girls, to mentors in CS; organized events at the annual summit

SKILLS

Technical

Python, Pytorch, TensorFlow, C++, C, R, HTML&CSS, JavaScript, React, SQL

Language

English, Chinese (Mandarin and Cantonese)