Junwei (Jaden) Liao

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Education

Xi'an Jiaotong University — Xi'an, China
Bachelor of Science in Artificial Intelligence — *Sep 2021 - Present*

- Cumulative **GPA:** 3.9/4.3
- **Relevant Coursework:** Linear Algebra & Geometry | Probability Theory & Mathematical Statistics | Computational Methods | Information Theory | Data Structure & Algorithms (Honor) | Intro to Machine Learning and AI | Computer Architecture | Mathematical Analysis in Engineering | Discrete Math
- **Awards:** Outstanding Student (2021 - 2023), HUAWEI scholarship

University of California, Berkeley — Berkeley, CA, USA
Visiting Student — *Aug 2023 - Dec 2023*

- Cumulative **GPA:** 4.0/4.0
- **Relevant Coursework**: Designing, Visualizing and Understanding Deep Neural Networks | Theoretical Statistics | Deep Reinforcement Learning, Decision Making & Control

Research Experience

Deep Reinforcement Learning Research Assistant Intern — Sep 2023 - Present
Depart. of Computer Science and Technology, Tsinghua University

- Conducted research under the guidance of Postdoc Sheng Yue, in Prof. Ju Ren's lab.
- Tried to facilitate Reinforcement Learning by leveraging the power of LLMs and VLMs, making RL more human-sensitive, robust and generic.
- Gained a deep understanding of RLHF and RLAIF, including fine-tuning LLMs with Reinforcement Learning.
- Investigated to find more effective solutions to offline pretraining and online fine-tuning.

Federated Learning Research Assistant Intern — Jan 2023 - Jun 2023
Depart. of Computer Science and Technology, Tsinghua University

- Learned about federated learning, analyzing challenges, and improving solutions under the guidance of Prof. Ju Ren's PhD candidate Yongheng Deng.
- Implemented various datasets on FL framework and conducted some research

Projects

Evaluating LLMs with Psychometrics | *Python* — Dec 2023

- Finetuned the LLM (using GPT-2 as base model) to imitate a variety of data (text styles), including Tweets, Reddit comments and news articles and observed how the psychometric results change.
- Implemented LoRA to achieve efficient finetuning.
- Explored a series of bottleneck-sizes in our LoRA configuration, conducted an in-depth analysis of compute and found the relationship between style-imitation performance and compute.
- Rated Excellent in the final project session of CS182 at UC Berkeley.
- Published to GitHub here.

Neural ODE for Dynamics Learning in Continuous-Time MBRL | *Python* Nov 2023 - Dec 2023

- Implemented Neural ODE to leverage dynamics learning in continuous-time MBRL using JAX.
- Explored a variety of Neural ODEs to evaluate performance.
- Found that using a relatively short episode length, the ODE model learns a better short-term dynamics compared to training with a longer episode length.
- Discovered that Neural ODEs behave quite differently from conventional model-based agents in that training them off-policy yields much better performance than training them on-policy.
- Rated 100/100 for its novelty, scope, analysis and completeness in the final project session of CS285 at UC Berkeley.
- Published to GitHub and see our paper here.

NUS SoC 2023 Summer Workshop | *Python, Java, JavaScript, HTML* Jul 2023

School of Computing, National University of Singapore *Singapore*

- Learnt AIoT related knowledge under the guidance of Prof. TAN Wee Kek.
- Led a team of 5 to develop an AIoT fitness assistance system called IntelliFit that analyzes exercise movements, provides real-time feedback(correctness) and advice.
- Processed frames with OpenCV, reduced dimensionality with PCA and classified posture using SVM
- Built a web interface to visualize classification results and exercise posture feedback for users in real-time.
- Received an A- for innovation, technical implementation, and presentation.

Data-Driven Model for Student Financial Aid Allocation | *Python* Jul 2023

- Clustered students using K-Means algorithm based on consumption features to identify groups with similar patterns.
- Developed XGBoost model using known poverty level data, and optimized it using cross-validation and heuristic algorithms.
- Allocated differentiated financial aid amounts to 80 most impoverished students based on poverty scores.
- Awarded Third Prize in the Mathematical Contest in Modeling at Xi'an Jiaotong Univ.

Transformer-based Semantic Segmentation for LC Surgery | *Python* Oct 2022 - May 2023

- Played a key role in data augmentation and preprocessing in this project. Researched and implemented various data augmentation techniques, including dynamic data augmentation to expand effective training dataset.
- Learned advanced deep learning models such as Transformer, ViT, U-Net, GAN for semantic segmentation.
- A related patent is being processed.