

# Liyi Yao

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## SUMMARY OF QUALIFICATIONS

Highly motivated machine learning engineer with a strong foundation in deep learning, computer vision, and natural language processing. Skilled in model optimization, pattern recognition, and large language models. Adept at researching, modeling and adopting state-of-the-art technologies to enhance model performance and solve real-world problems. Collaborative team developer driving innovation and delivering impactful solutions in fast-paced environments. Eager to continually learn and contribute to the development of cutting-edge machine learning solutions.

## EDUCATION

### University of Southern California

*Master of Science in Computer Science*

**Jan 2023 – May 2024**

*Los Angeles, CA*

### Sichuan University

*Bachelor of Engineer*

**Sep 2018 – Jun 2022**

*Chengdu, China*

## WORK EXPERIENCE

### USC Institute for Creative Technologies

*Researcher*

**Mar 2024 – Present**

*Los Angeles, CA*

- Design and deploy a data synthesis method based on feature domain matching to enhance unsupervised group activity recognition for video data.

### DeepUSC

*Research Intern*

**Mar 2023 – Dec 2023**

*Los Angeles, CA*

- Developed a tool for massive ablation experiments based on Pytorch and HuggingFace, and deployed it on Transformer-based models to probe to scaling law of large language models saving lots of manual efforts.
- Extracted fact statements from natural language and fine-tuned pre-trained language models for classification. Integrated this module to a tool used to probe the reasoning abilities of large language models such as GPT and Bert.
- Researched and implemented SOTA-level fine-tuning (transfer learning) methods and performed experiments for evaluation.

### Sichuan University

*Research Assistant*

**Aug 2020 – June 2022**

*Chengdu, China*

- Led a research project and proposed a novel unsupervised anomaly detection model based on knowledge distillation achieving SOTA-level performance on industrial manufacturing benchmark datasets. Implemented the algorithm using Pytorch and integrated visualization functions.
- Led a project collaborating with China Academy of Railway Science Co.,Ltd. and developed an end-to-end defect detection tool for railway system components based on GAN and Yolov3 achieving 95%+ accuracy and 93%+ mAP.
- Researched underwater image enhancement methods and designed an evaluation metric to probe the quantitative performance.

### Pony.ai

*Software Development Intern*

**Sep 2021 – Dec 2021**

*Beijing, China*

- Trained and maintained models for traffic light recognition in a large-scale autonomous driving perception system based on C++ and Python and improved the detection accuracy by on certain scenarios including single light, flashing yellow light, etc.
- Optimized classification models' backbones by merging various models into multi-branch models and improved the training strategy by weighting each branch based on the gradients to avoid overfitting. The modification can reduce the parameter scale and save the storage space of on-board chips.

## TECHNICAL SKILLS

**Programming:** Python, C++/C, Java

**Machine Learning:** Pytorch, Tensorflow, Keras, HuggingFace, Scikit-learn, MATLAB, Matplotlib, Pandas

**Web Technology:** JavaScript, Flask, AWS

**Development:** Github, Linux, HDFS, Kubernetes, Conda, Unity