Yiyang (Lawrence) Luo

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Education

Nanyang Technological University (NTU) Singapore
M.Sc. in Artificial Intelligence (MSAI) Jan 2023 - Present
Cumulative GPA: 4.5/5.0
Relevant Coursework: Deep Learning & Applications, Mathematics for Artificial Intelligence

The Chinese University of Hong Kong (CUHK) Hong Kong, China
B.Sc. in Computer Science Aug 2018 - Jul 2022
Cumulative GPA: 3.456/4.0
Relevant Coursework: Fundamentals of Artificial Intelligence (A-), Software Engineering (A-), Design and Analysis of Algorithms (A-), Open-source Software Project Development (A-), Probability and Statistics for Engineers (A)

Skills

- Programming Languages: C, Python, Java, JavaScript, JSON, YAML, Rust
- Software Skills: Latex, Git, PyTorch, OpenCV, Docker
- Language Skills: Mandarin (native), English (fluent)

Publication

J. Zhou, C. Leong, **Y. Luo**, M. Lin, W. Liao and C. Li, *"Unified Feature Fusion Network with Path Router for Multi-task Image Restoration,"* 2021 IEEE 21st International Conference on Communication Technology (ICCT), 2021, pp. 1206-1210, doi: 10.1109/ICCT52962.2021.9658001.

Internship

Huawei Hong Kong Research Center Hong Kong, China
Research Intern Expected May 2023 – Aug 2023

- Conducted extensive research on various frameworks, such as Dask, Torch, Mindspore, among others, to evaluate their parallel strategies and distribution system designs. Utilized this analysis to select the most suitable framework for our algorithms.
- Devised and implemented tensor native graph algorithms on distributed systems with leveraging parallel computing techniques, resulting in accelerated algorithm performance. Achieved comparable performance to Rapids' Cugraph package which is designed by Nvidia, with only a marginal 5% reduction in speed.
- Integrated multiple hardware components, including GPUs and NPUs, into the system to enhance computational capabilities and broaden hardware support.

SmartMore Shenzhen, China
Computer Vision Algorithm Engineer Jun 2022 – Dec 2022

- Analyzed industrial image data and preprocessed datasets based on defects with multiple data augmentation methods to enlarge the dataset and add variance to data, therefore enhancing the model's robustness and prediction accuracy
- Improved SmartMore's SMAP codebase, a full-functional modularized AI training codebase, by adding new features such as label area filter, multi-channels image augmentation, and auto machine learning (hyper-parameter search)
- Designed and finetuned models to conduct segmentation tasks on detecting different products' defects including wireless charging coils, earphone spiales, hard drive filters, etc.
- Applied an auto machine learning algorithm to search the optimal hyper-parameter settings for defect segmentation tasks on Airpods spiale, and designed SDK for further algorithm development and project management
- Developed and improved Dataflow, a full-functional AI training platform with a user-friendly interface supported by SMAP, by adding new features such as data distribution visualization, local deployment, etc.

Research Experience

Intriguing Properties of Long-tailed Recognition Problem, Final Year Project Hong Kong, China
Supervised by Jiaya Jia (Professor, CUHK) & Bei Yu (Associate Professor, CUHK) Sep 2021 - May 2022

- Researched 12 artificial intelligence papers and gained insights into these methods on long-tailed recognition problem, including data augmentation, knowledge distillation, and decoupling training; reproduced and analyzed the experiment results of different approaches to compare their features and find their relationship using Pytorch
- Found and verified that the influence of batch size setting can be different on different classifier retraining methods, conducted further research on different methods' influences on model's prediction variance
- Completed a 20-page report on research results and presented the result to professors; got A- at the end of the semester

Unified Feature Fusion Network with Path Router for Multi-task Image Restoration, Non-Territories Network Lab, School of Electronics and Communications Engineering, Sun Yat-sen University Guangzhou, China
Supervised by Congduan Li (Associate Professor, Sun Yat-sen University) Jun 2021- Aug 2021

- Applied multiple data augmentation methods including CutOut, MixUp and CutMix using Python to enlarge the training dataset and therefore enhance the model's robustness
- Programed the AI agents based on Multi-task Learning with Multi-gate Mixture-of-Experts (MMoE) in Pytorch
- Evaluated model performance and adjusted to acceptable results, collected and analyzed experiment data for paper writing
- **Released *Unified Feature Fusion Network with Path Router for Multi-task Image Restoration* on ICCT2021 as co-author**

Project Experience

Parallel Computing Project | Hong Kong, China Jan 2022 - Apr 2022

- Used three different parallel computing tools, SIMD, CUDA on GPU, and MPI, to compute the Pareto optimality of vectors as fast as possible, and finally managed to compute the correct answer of 1,024,000 5-dimension vectors in less than 1.5 seconds using SIMD and less than 0.5 seconds using CUDA
- Applied various optimization algorithms on different platforms, such as complex data structure KD Tree on SIMD and full use of CUDA memory buffer, to maximize the algorithm performance

Cloud Storage Deduplication Project | Hong Kong, China Sep 2021 - Dec 2021

- Worked as a team of 3 to realize a storage-efficient deduplication algorithm in Java based on chunking and Rabin fingerprint, which supported uploading, downloading, and deleting, to simulate popular cloud storage applications like Dropbox or OneDrive

EgoPod, A Web-based Podcast App Supports Note Taking | Hong Kong, China Jan 2021 - Apr 2021

- Worked as a team of 2 to design, develop and deploy a podcast app that supports login with a Google account, searching podcasts from iTunes, subscribing to podcasts, bookmarking episodes, note taking, audio clipping, and note downloading
- Developed frontend base on React framework, developed backend with Express Node.js to handle HTTP requests and manage user data using MySQL system
- Deployed Egopod service using Docker and Yarn to generate a stable distributed environment that ensures the application works stably on any platform and is easily deployable by any user

Extracurricular Experience

Mandarin Debating Club | *Debater* | Hong Kong, China Sep 2018 – Jun 2022

Orientation Camp of CUHK | *Team Leader* | Hong Kong, China Aug 2019 - Sep 2019