

YIYANG LUO, LAWRENCE

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Education

Nanyang Technological University(NTU)

M.Sc. of Artificial Intelligence (4.6/5.0)

Jan. 2023 – May 2024

Singapore, Singapore

The Chinese University of Hong Kong(CUHK)

B.Sc. of Computer Science(3.46/4.00), Second Upper Class Division

Aug. 2018 – Jul. 2022

Hong Kong, China

Publications

- * **Luo, Y.*** & Lin, K.* (2023). PISA: Point-cloud-based Instructed Scene Augmentation. *arXiv preprint [Cs.CV] arXiv: arXiv.2311.16501*. Submitted to The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024.
- * Lin, K. & **Luo, Y.**(2023). Zero-Shot Generative Linguistic Steganography. Submitted to 2024 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL).
- * Zhou, J., Leong, C., **Luo, Y.**, Lin, M., Liao, W., & Li, C. (2021, October). Unified Feature Fusion Network with Path Router for Multi-task Image Restoration. In *2021 IEEE 21st International Conference on Communication Technology(ICCT)*(pp. 1206-1210). IEEE.

Internships

Huawei Hong Kong Research Center

Research Intern

May 2023 – Aug. 2023

Hong Kong, China

- Undertook comprehensive research on various distributed frameworks, including Dask, Torch, and Mindspore, to assess their parallel distribution system designs.
- Developed and executed tensor native graph algorithms on distributed systems, leveraging parallel computing techniques. This implementation significantly enhanced algorithm performance, achieving a speed comparable to Nvidia's Rapids' Cugraph package, with only a minimal 5% reduction.
- Enhanced system computational capabilities and expanded hardware support by integrating multiple hardware components, such as GPUs and NPUs. This integration played a crucial role in optimizing system performance.

SmartMore

Computer Vision Algorithm Engineer

Jun. 2022 – Dec. 2022

Shenzhen, China

- 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).
- 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.

Research Experience

Point-cloud-based Scene Augmentation, Master Research Project

Supervised by Guosheng Lin (Assoc. Professor, NTU)

Jan. 2023 – Nov. 2023

Singapore, Singapore

- Developed a novel multi-modal deep neural network for 3D scene augmentation based on text instructions. Applied diffusion model and cross-attention mechanism to generate realistic and consistent objects in the desired locations.
- Designed a data pipeline to transform existing visual grounding dataset into generative instructions. Employed prompt engineering and large language models (GPT-3.5 and GPT-4) to paraphrase descriptive texts into generative texts. Applied rule-based filtering and manual correction to ensure the quality of the transformed dataset.

Properties of Long-tailed Recognition Problem

Supervised by Jiaya Jia (Professor, CUHK) & Bei Yu (Assoc. Professor, CUHK)

Sep. 2021 – May 2022

Hong Kong, China

- Researched and gained insights into methods on long-tailed recognition problems; 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 could be different on different classifier retraining methods, conducted further research on different methods' influences on model's prediction variance.

Multi-task Image Restoration

Supervised by Congduan Li (Assoc. Professor, Sun Yat-sen University)

Jun. 2021 – Aug. 2021

Guangzhou, China

- Applied data augmentation methods to enlarge the training dataset. Programed the AI agents based on Multi-task Learning with Multi-gate Mixture-of-Experts (MMoE) in Pytorch.
- Evaluated model performance, adjusted models, and collected and analyzed experiment data for paper writing.

Skills

Languages: Python, Java, C, JavaScript, SQL, Rust

Developer Tools: Latex, Git, PyTorch, Docker, Hadoop, CUDA

Languages: Mandarin(native), English(IELTS 7.5)