Ziming Luo

Email: luozm@umich.edu | Tel: (734) 881-5018 | Homepage

Education

- **University of Michigan - Ann Arbor** *Aug 2023 - Present*
  Major: *Electrical and Computer Engineering - Signal & Image Porcess and Machine Learning* ***GPA****: 4.0/4.0*
  - **Honor:** The Wang Kuo Tong Memorial Fellowship 2023-2024
  - **Finished Coursework:** Probability and Random Process (A+), Foundation of Computer Vision (A+), Matrix Methods for Signal Processing, Data Analysis and Machine Learning
  - **Current Coursework:** Advanced Topics in Computer Vision, Machine Learning, Large Language Model

- **Shenzhen University - Guangdong, China** *Sept 2019 - July 2023*
  Major: *B.Sc in Information and Computing Science (Honor)* ***Minor:*** *B.Sc in Computer Science and Technology*
  - **Honor:** Outstanding Graduate Award
  - **Selected Courses:** Data Structure (A+, 93/100), Computer Systems (A, 90/100), Software Engineering (A+, 93/100), Mathematical modeling (A+, 93/100), Numerical Analysis(A+, 94/100), Mathematical methods for image processing (A+, 94/100), Computer Graphics (A, 90/100)

- **Shenzhen University - Guangdong, China** *Sept 2021 - June 2023*
  Micro Program: *Artificial Intelligence*
  - **Selected Courses:** Overview of Artificial Intelligence (A+, 93/100), Preliminary Machine Learning (A+, 93/100), Practice and Application of Deep Learning (A+, 97/100), Fundamentals and Application of Cloud Computing (A, 92/100), Computer Vision (A, 91/100)

Reserach Experience

- **Guangdong Key Laboratory of Intelligent Information Processing** *Mar 2022 - Feb 2023*
  Research Assistant *Paper link*
  - Developed a semi-supervised learning model based on rough sets, in which a novel heuristic algorithm was developed for feature selection on partially labelled data, and an efficient data editing technique was designed to remove the classification noise.
  - **Journal Paper: Luo Z.**, Gao C. & Zhou J. Rough sets-based tri-trade for partially labeled data. Applied Intelligence (IF: 5.3), 2023.

- **Big Data institute Shenzhen University** *Jul 2021 - Feb 2022*
  Research Assistant *Paper link*
  - Developed a Label-Aware Recurrent Reading network to deal with multi-label classification problems in natural language processing, achieved a label-aware document representation based on the top-down mechanism in neuroscience, and adopted the attention mechanism to dynamically adjust the word weights.
  - **Conference Paper:** S. Ming, H. Liu, **Luo Z**, et al. Label-Aware Recurrent Reading for Multi-Label Classification, Asia Conference on Algorithms, Computing and Machine Learning (CACML), 2022.

Project Experience

- **University of Michigan** *Project link*
  Fast Food Chain Store Management - Falled Food Recognition *Oct 2023 - Dec 2023*
  - A computer vision and deep learning project improves hygiene and the customer experience at fast food chains by recognizing burger buns that fall on the ground without being noticed. We created a unified pipeline for real-time video to determine if a hamburger falls on the ground. This model is small and fast enough for edge computing implementation on terminal devices.
  - Food detection: Training YOLOv8 food instance detector; Ground segmentation: SLIC algorithm to segment ground superpixels; Pre-trained ResNet50 is used as a feature extractor and multilayer perceptron is trained for binary classification.

- **Shenzhen Customs Intelligent Discipline Inspection Laboratory** *Guangdong, China*
  Customs Commodity Tax Evasion Identification *July 2021 - Aug 2021*
  - Designed and built a commodity knowledge graph using customs entry form data before storing it in the Neo4j graph database, involving data cleaning, data mining and distributed storage.
  - Developed multiple mathematical models to check corporate tax evasion based on the commodity knowledge graph, extracted the key clue of "illegal tax evasion" such as false reporting of the commodity type and under-reporting of the commodity price, and succeeded in recovering over **RMB 20 million** in tax evasion for Shenzhen Customs by 2022.
  - Secured funding from the *National College Student Innovation and Entrepreneurship Training Program* and the *Guangdong Provincial Science and Technology Innovation Strategy Special Fund* as the project leader.
  - Registered a software copyright "Customs Knowledge Graph System" (as the first contributor) to perform the functions of commodity information query, statistics and visualisation.

- **National Engineering Laboratory for Big Data System Computing** *Guangdong, China*
  Pedestrian Gait Recognition *Mar 2021 - Jun 2021*
  - Collected and cleaned video surveillance data before performing image enhancement algorithms.
  - Designed a model for pedestrian capture and background segmentation in video based on YOLOv5 model.
  - Deployed the model to website based on the Django and Vue framework.

Competitions & Prizes

09/2022 *Third Prize*, **Chinese College Students Computer Design Competition**
05/2022 *Second Prize*, **"Blue Bridge Cup" National Collegiate Programming Competition**
12/2021 *Grand Prize(Top 3%)*, **"Liyuan Challenge" Innovation and Entrepreneurship Competition**
09/2021 *Third Prize*, **Contemporary Undergraduate Mathematical Contest in Modeling**
09/2021 *First Prize (Top 2%)*, **"SZU Cup" Mathematical Contest in Modeling**
04/2021 *Meritorious Winner*, **COMAP Mathematical Contest in Modeling**
12/2020 *First Prize(Top 3%)*, **"Greater Bay Area Cup" Financial Mathematical Contest in Modeling**

Technical Skills

- **Professional Skills:** Good command of basic computer vision tasks(object detection and classification, image segmentation, etc.), typical vision model construction using mainstream frameworks(pytorch, openCV, transformers), common knowledge of supervised/unsupervised/semi-supervised learning.
- **Supplementary Skills:** C/C++, Matlab, Linux, Git, Web Development (HTML, CSS, JavaScript), Flask/Django, SQL, Tableau, Latex