Ziming Luo

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

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
  - **Coursework:** Probability and Random Process (A+), Foundation of Computer Vision (A+), Matrix Methods for Signal Processing, Data Analysis and Machine Learning

- **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** *Ann Arbor, US*
  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*
  Harassing Phone Calls Recognition *Oct 2020 - Nov 2020*
  - Applied the Random Sample Partition distributed sampling technique to process about 1.6 billion phone call records(TB-level) in a distributed system.
  - Constructed harassing phone features through a combination of data pre-processing, feature engineering and mathematical modelling base on the Spark framework.
  - Constructed a ensemble model based on Random Forest to identify harassing calls and improved the recall of the model by 6% through the oversampling technique.

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, Web Crawler, Web Development (Flask, SQL), Latex, Tableau, PyQt