Hanyu Zeng

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Personal Website — Google Scholar Profile

Education

- **University of Pittsburgh**, Pittsburgh, USA *2024/01 – Present*
  Ph.D. student in Information Science
- **National University of Singapore**, Singapore *2021/07 – 2023/02*
  Master of Intelligent Systems
- **University of Electronic Science and Technology of China**, Chengdu, China *2017/09 – 2021/06*
  Bachelor of Communication Engineering
- **University of Glasgow**, Glasgow, UK *2017/09 – 2021/06*
  Bachelor of Electronic Engineering

Research Experience

- **Self-Supervised Learning for Anomaly Detection** *2022/02 – 2022/07*
  Advanced Digital Science Center, Singapore
  - Proposed a self-supervised learning model for industrial anomaly detection using the BERT model, trained with minimal labeled data.
  - Developed a novel loss function to address imbalanced datasets, achieving **93% accuracy**, surpassing other SOTA models by **15%**.
  - Published in *SmartGridComm 2022*: "Detecting Cyber Attacks in Smart Grids with Massive Unlabeled Sensing Data."
- **Diabetic Insulin Management System** *2024/04 – 2024/09*
  University of Pittsburgh, USA
  - Designed an insulin management system providing personalized injection recommendations based on diet descriptions and historical glucose/injection data.
  - Introduced a supervised learning model that enabled patients to perform customized fine-tuning, eliminating the need for professional guidance in model training.
  - Integrated **LLM** and **ML** models for unstructured text and time-series data mining, achieving **25% higher performance** than other SOTA models.(Target NeurIPS2025)
- **Real-Time Dietary Analysis System** *2024/10 – Present*
  University of Pittsburgh, USA
  - Developed the first real-time dietary analysis system for smart glasses, combining camera image data and IMU sensor inputs.
  - Leveraged **Yolo-world**, **LLaVA**, and **SAM** for multimodal interaction and nutrient intake estimation.
  - Built on **Mobile MLLM** technology to provide efficient and accurate dietary analysis.(Target CVPR2025)

Work Experience

- **Machine Learning Engineer**
  Meituan, Beijing, China *2023/07 – 2023/12*
  - Designed and developed an AI agent integrating **GPT** (router) and **Qwen** (multi-modal interaction):
    * Enabled multi-turn conversations for personalized recommendations on attractions, accommodations, and itineraries.
    * Improved user engagement by answering queries with relevant image evidence.
    Deployed the product for **A/B testing** after successful internal validation.
  - Built a user intent classification system using BERT_Large on Kafka, achieving **90% accuracy**, now applied in chatbot query routing for pre-sales and after-sales support.
  - Enhanced GIS alignment using NER and BERT models, reducing SQL database redundancy by **15%**.

Technical Skills

- **Programming Languages:** Python, Java, C, C++, MATLAB, SQL, R, HTML, JavaScript
- **Frameworks and Libraries:** TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, FastAPI, HuggingFace
- **Cloud and Platforms:** AWS (EC2, S3, Lambda), Google Cloud, Spark, Hadoop
- **Databases:** MySQL, PostgreSQL, MongoDB, Redis
- **Other Skills:** Git, Docker, Linux/Unix, Tableau, Object Detection/Tracking, Anomaly Detection, CPS, IoT system, Mobile Network, NLP, CV, Signal Processing, Time-Series Data Forecasting, Machine Learning, LLM fine-tuning, mobile MLLM