Haoyue Sheng

819-979-3517
haooyuee@gmail.com
Montréal, QC
www.linkedin.com/in/haooyuee
https://haooyuee.github.io/
https://github.com/haooyuee

Education

M.sc. Computer Science - Machine Learning *l'Université de Montréal & Mila*

- Focused Studies: Deep Learning, Machine Learning, Data Science, Data Structures&Algorithms Analysis
Current GPA: 3.9/4.3

B.Eng. Mechatronics *l'Université du Québec à Trois-Rivières*

- Focused Studies: Finite Element Analysis(FEA), Automation & Programming, Circuit Design, Microcontrollers, Advanced PLC Techniques
GPA: 3.8/4.3

Work Experience

Data Science Specialist Intern *May 2023 – March 2024*
CIUSSS du Centre-Sud-de-l'Île-de-Montréal *Montreal, Canada*

- Developed and deployed a computer vision-based diagnostic aid platform to assist radiologists, utilizing PyTorch, MMDetection, and YOLOv5&v8 toolboxes.
- Implemented the Barlow-twins CXR self-supervised learning strategy to address the challenge of insufficient labeled data, achieving a 3% improvement in mAP on the test set and publishing a related paper.
- Designed and developed a novel AUC-ROC metric to more accurately assess detector performance, which has been adopted by the research team.
- Utilize Linux for efficient resource allocation and model training acceleration through distributed training techniques.
- Leverage Azure DevOps for version control, continuous integration, and work management to enhance team collaboration efficiency.

Automation Engineering Intern *May 2021 – September 2021*
HYVA Machinery (China) Co., Ltd. *Yangzgou, China*

- Maintained and optimized an automated production line, focusing on optimizing its performance. Included programming tasks for materials handling transfer robots.
- Participated in the design and construction of automatic welding production lines, handled programming and debugging responsibilities for new industrial robots

Project Experience

RAG Local Assistant Chatbot *Spring 2024*

Developing a Retrieval-Augmented Generation (RAG) Local Assistant Chatbot using LLaMA2-7B, GEMMA-2B, LangChain, and Hugging Face Transformers for secure, offline functionality on personal computers.
Leverage Steamlit to create a user-friendly interface for the chatbot, package it with Docker for easy deployment and distribution.
Ongoing projects. Continuous analysis to optimize response accuracy and efficiency using a combination of NLP benchmarks and custom evaluation metrics.

LLM-based Text Summarization Generation *Fall 2023*

Explore large language model-based, automated text summarization techniques using CNN/Daily Mail datasets to fine-tune GPT-2, T5, and GPT-3.5 models.
Rigorous model performance evaluation and analysis through ROUGE and BERT scores and human feedback.
Created a technical report explaining the importance of various evaluation methods and provided insights to enhance the summary model.

NHL Shot Analysis & Predictive Model *Fall 2022*

Developed a goal-scoring prediction system from scratch, encompassing data collection, preprocessing, feature engineering, and model training and deployment.
Collected data using APIs, built robust pipelines to retrieval and preprocess shot datasets.
Analyzed shot and goal distributions through data visualization, deriving novel insights and feature ideas.
Built a demo app using Flask and Streamlit to showcase findings and containerized it with Docker for seamless deployment.

Movie Review Sentiment Analysis Text *Fall 2022*

Trained robust textual sentiment classification models using over one million textual data.
Collaborated within the team. Applied Natural Language Processing (NLP) techniques combined with machine learning and deep learning algorithms to systematically preprocess and emmbedding data.
Performed careful hyperparameter tuning to optimize model performance and achieve 91% accuracy.

Recyclable garbage Recognition Project *Fall 2020*

Developed models to help sorting centers categorize various collected materials.
Implemented data augmentation techniques to augment the size of limited datasets. Trained a Convolutional Neural Network (ResNet-50 architecture) to classifier multiple types of recyclable waste. Got more than 95% accuracy on the test set.

Publication

Sheng, H., Ma, L., Samson, J.-F., & Liu, D. (2024). BarlowTwins-CXR: Enhancing Chest X-Ray abnormality localization in heterogeneous data with cross-domain self-supervised learning. arXiv preprint arXiv:2402.06499.

Technical skills

Programming Language	Python (comfort), Java, C
ML & DL Tools	Pytorch, Keras, Scikit-learn, MMdetection, transformers, Langchain, Weight & Bias, etc.
Data science Tools	Pandas, NumPy, Matplotlib, Seaborn, SQL, NoSQL
Other	Linux, Git, Docker, Matlab, Simulink, SolidWorks, AutoCAD, etc.

Personal skills

Langues	English, French, Mandarin.
Soft skills	Quick learning, team player, time management