HAOZHE(STEVEN) LIU

lhzcareer@gmail.com · 858-888-2855 · Haozhe Liu · Haozhe Liu

Education

Stevens Institute of Technology, NJ. 09/2023 - 05/2027 (Expected)
Ph.D. in Biomedical Engineering (medical artificial intelligence track) GPA:3.83

University Of California San Diego, CA. 09/2020 - 12/2022
M.S. in Electrical and Computer Engineering (image processing track) GPA:3.80

Rensselaer Polytechnic Institution, NY. 09/2016 - 05/2020
B.S. in Electrical Engineering GPA:3.65

Internship Experience

Colgate-Palmolive, NJ. 05/2024 - 08/2024
Machine Learning Engineer Intern

- Developed an advanced **Pytorch**-based **UNet** model with attention mechanisms for precise pet food segmentation, performing 3D visualization with **Amira** and achieving a **9%** improvement over the SOTA in Dice score.
- Created a ranking strategy and recommendation system using GPT-4 APIs to better gather pet clinical information and store it in **SQL**, outperforming existing models like Llama3, in fluency, professionalism, and effectiveness.
- Designed a **vision-language** model to generate pet medical reports from multiple imaging sources, achieving a **25%** improvement over the SOTA in both text quality and clinical efficacy, enhancing insights for veterinary care.

Tecent Smart Healthcare, China 05/2023 - 08/2023
Software Engineer Intern

- Designed and distributed customer intention survey questionnaires as a leader of the team, completed **Figma** website design and implemnted company's social networking website accordingly using **React** and **Redux**.
- Improved website using **Express.js**, **Bootstrap**, and **jQuery**, incorporating features such as account switching and QR code functionality and improving aesthetics to significantly enhance the user experience.
- Developed a medical report generation model using **LLM** to integrate medical history, imaging, and suggestions.
- Integrated and fine-tuned the **GPT3.5** model in the forum platform chatbox, automating customer interactions with intelligent auto-reply solutions, reducing response time by **50%** and improving accuracy by **30%**.

Researches Experience

Adaptive Region-based Super-resolution for Medical Image Segmentation 06/2024 - 12/2024
Research Assistant in Dr. Yu Gan's Lab

- Developed a deep learning model that zooms into target areas in medical images to provide high-resolution details and better segmentation results, increasing the Dice score and dramatically lowering computational demands.
- Designed CNN architectures and custom loss functions; performed comparative studies using **TensorFlow**.
- Enhanced the **YOLOv8** model with position encoding to leverage spatial information for object detection.
- Evaluated the effect of parameters via ablation experiments and futher improved model performance by **20%**.

Label Correction Framework for Medical Images Segmentation 09/2023 - 03/2024
Research Assistant in Dr. Yu Gan's Lab

- Contructed an segmentation label correction **UNet** model based on weakly supervised learning model **SAM**.
- Applied **curriculum learning** to sort training datasets based on shape complexity and background noise ratio.
- Employed the Monte Carlo sampling technique to estimate pixel uncertainty and correct noisy labels accordingly.
- Applied **diffusion models** for generating synthetic images to enhance data diversity and model robustness.

Skills

- **ML/DL Frameworks**: Pytorch, TensorFlow, Scikit-learn, Keras, OpenCV, OpenPCDet.
- **Vision Models**: UNet, UNet ++, Swin-UNet, ResNet, VGG, Yolov8, GANs, Diffusion Models.
- **Language Models**: GPT3.5, GPT4, Llama2, Llama3, MiniLM, Hugging Face Transformers.
- **Programming Language**: Python, Matlab, Java, C, C++, HTML5/CSS/JavaScript, MySQL.
- **Web/Cloud Tools**: Node.js, Express.js, MongoDB, React, Redux, AWS, Azure.