Mengyi Zhou

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Education

Imperial College London 09/2023 - 09/2024
Master of Research (MRes) in Medical Robotics and Image-Guided Intervention
Average score (currently): 70.07/100 (3.9/4.0)

Beijing Normal University 09/2019 - 06/2023
Bachelor of Science (BSc) in Computer Science and Technology
Average score: 87.66/100 (3.7/4.0)

Working Papers

[1] **Mengyi Zhou,** Chi Xu, Stamatia Giannarou. Microscopic Visual Servoin for Robot-assisted Endomicroscopy Tissue Scanning. **(In Progress)**

Academic Experiences

Federated Learning Diffusion 06/2024 - Present
Supervisor: Prof. Bo Zhou | Northwestern University *Remote*

- **Project Overview:** Developing a diffusion-based medical image translation system aimed at securely transferring data between different datasets using federated learning to ensure privacy.
- Conducted an extensive literature review to evaluate the strengths and limitations of previous generative models.
- **Ongoing Work:** Currently working on a generalized denoising and translation model based on Diffusion that obviates the need for specialized noise type specifications, thus improving model adaptability and general applicability.

Microscopic Visual Servoing for Robot-assisted Endomicroscopy Tissue Scanning 02/2024 - Present
Supervisor: Prof. Stamatia Giannarou, Chi Xu | Imperial College London *London, UK*

- **Project Overview:** Developed a deep learning-based system to guide robot-assisted endomicroscopy, particularly focusing on tissue scanning using probe-based confocal laser endomicroscopy (pCLE).
- Extended single-image distance regression to video-based regression using temporal information from pCLE videos, improving accuracy and stability.
- Developed a trajectory planning algorithm that optimized probe paths, resulting in a 26% improvement in probe fluctuation distance accuracy.
- **Outcome:** One paper in progress. **Poster** presentation at the 16th Hamlyn Symposium on Medical Robotics, June 25, 2024.

Development of a Multi-sensing Optical Probe for Tumour Margin Mapping 10/2023 - 12/2023
Supervisor: Prof. Alex Thompson, Prof. Stamatia Giannarou | Imperial College London *London, UK*

- **Project Overview:** Developed a multi-sensing system to facilitate real-time, accurate tumor margin mapping by combining confocal endomicroscopy images with Raman spectra.
- Achieved 99.3% accuracy in tumor classification by developing a VGG19-based classifier for pCLE images.
- Integrated Raman spectral classification with pre-trained models and PCA-based techniques, resulting in a 20% accuracy improvement over traditional Raman-only methods.
- **Outcome:** Developed a robust multimodal classification model with enhanced accuracy through fusion of visual and spectral data..

Classification of Eclipsing Binary Light Curves Based on Deep Learning 12/2022 - 05/2023
Supervisor: Prof. Xianchuan Yu | Beijing Normal University *Beijing, China*

- **Project Overview:** Implemented a deep learning model to classify eclipsing binary light curves, contributing to the analysis of astronomical data.
- Applied periodogram methods to estimate non-equally spaced time series periods and smoothed light curve data using Linear Interpolation for classification.
- Developed an auto-encoder model based on LSTM for unsupervised feature extraction, achieving a classification accuracy of 90%.
- **Outcome:** This research formed the basis of my Undergraduate Graduation Thesis.

Project Experiences

SpacToolChain Game Visualization Development Toolset 05/2024 - Present

Core Member, Back-End developer

- **Introduction:** Contributing to the development of an automated toolset designed to streamline game content creation by separating front-end and back-end operations, utilizing **Vue.js 3** for the front-end and **Flask** for the back-end. This toolset is intended for internal use within a game development project.
- Developed and implemented a node-based data storage management system using Flask, enabling efficient handling of game-related data and assets.
- Integrated a personnel rights management system to facilitate role-based access control within the toolset, ensuring secure and controlled content creation workflows.
- **Ongoing Development:** Currently working on gameplay development features in **Unity**, focusing on core mechanics such as action logic, an equipment system, and its effects on combat.
- **Current Outcome:** A web-based interface for managing game content, including non-player characters (NPCs), dialogues, and other in-game assets. The system is actively used in game development to streamline content creation and personnel management.

Awards

Outstanding Undergraduate Graduation Thesis 2023
Mathematical Contest in Modeling (MCM) - Finalist (Top 2%) 2022
Scholarship for Competition Participation - First-Class 2022
Scholarship for Academic - Third-Class (twice) 2021 - 2022

Extracurricular Activities

"EnviroMoment" Environmental Education Innovation and Communication 2021 - 2022
Beijing Normal University Cycling Association - Vice President 2021 - 2022
Beijing Normal University Volunteer Teacher Team - Publicity Vice Director 2021

Skills

Programming: Python (PyTorch, TensorFlow, SKLearn, Flask, etc.), C/C++, MATLAB, Java, SQL
Modeling and Multimedia Softwares: Unreal Engine 4, Unity, Blender, PS, PR, AU
Language: Chinese (native), English (IELTS-7.0)