Puming Jiang

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Education

Imperial College London, London, UK **Oct 2019 – Sep 2024**

- MRes in Artificial Intelligence and Machine Learning
- Research topic: Integrate multimodal input to offer tailored feedback in robotic tutoring.

University of Cambridge, Cambridge, UK **Oct 2019 - June 2023**

- MEng in Information and Computer Engineering
- Honours with Distinction in Final Year; First Class Honor on all academic year
- Awards: Continuing Senior Scholarship; Senior Scholarship

Ruthin School, Ruthin, UK **Oct 2017 – June 2019**

- A-level: Maths (A*), Further Maths (A*), Physics (A*), Chemistry (A)

Research Experience

Integrate multimodal input to offer tailored feedback in robotic tutoring (MRes Research Project)

Oct 2023 – Present

- Objective: Incorporate verbal input into the teaching robot to allowing it to analyse spoken feedback and deliver more personalized responses to enhance the learning experience.
- Proposed Solution: Utilized LLMs to decipher student understanding, create one-hot encoding to monitor student progress, and refine feedback mechanisms.
    - Investigate adult learners for progress in solving math problems.

Develop a novel AAC text generation system powered by image recognition and LLM (Research Assistant)

Sep 2023 – Oct 2023

- Objective: Develop a novel Augmentative and Alternative Communication (AAC) text generation system for individuals with motor disabilities.
- Contributions:
    - Designed a system that utilized image recognition models and LLMs for efficient story generation.
    - Achieved a remarkable keystroke savings of 94.4%, much higher than state-of-the-art.
    - Systematically identified the existing limitations of the current system through human evaluations.
    - Proposed three design guidelines for further improvement of this human-in-the-loop interaction process.
- Publications: Co-First Author for “ImageTalk: A Multimodal AAC Text Generation System Driven by Image Recognition and Nature Language Generation”, currently under review by IUI 2024 conference.

Accurate and Detailed Human 3D Shape Estimation from Mobile Phone Images (MEng Final Year Project)

Sep 2022 – June 2023

- Objective: Enhance the body shape prediction accuracy when using RGB images.
- Contributions:
  - Addressed low-resolution limitations by using zoomed-in body part images.
  - Leveraged optical flow for accurate joint prediction transfer from full-body to zoomed-in images.
  - Trained a transformer to merge shape predictions from various body segments.
  - Achieved notable reductions in prediction errors: (e.g., Forearm length: 1.9 cm to 1.7 cm. Forearm circumference: 2.4 cm to 1.8 cm.)
- Achievement: Secured a First-Class Honor for the project.

Supporting Rainforest Regeneration with Deep Learning (CNN-based) Methods Applied to UAV Images (Research Assistant)

July 2022 – Aug 2022

- Objective: Automate detection and mapping of liana infestations in tropical forests, and such reducing the need for manual expert ground labelling.
- Contributions:
  - Enhanced existing code to expand pure tree crowns detection capabilities to classify lianas on individual tree crowns.
  - Managed code development, hyperparameter tuning, network training, and model evaluation.
  - Addressed unevenly distributed training data and minimized class discrepancies.
  - Applied regularizations to prevent overfitting; marking a significant outcome for a challenging task.

Artificial Intelligence Based Early Diagnosis System for Light-Chain Amyloidosis (Research Assistant)

July 2021 – Aug 2021

- Objective: Investigate potential for earlier amyloidosis diagnosis using data from routine physical examinations.
- Contributions:
  - Handled data preprocessing to address inherent dataset challenges, such as noise and bias towards healthy individuals.
  - Conducted noise reduction, and smart sampling of healthy data to balance the training set and implemented various diagnostic algorithms for comparison.
  - Achieved significant progress in model development for diagnosing amyloidosis.
  - Received high evaluation post-internship for contributions and outcomes.
- Publications: Co-Author for "Development of an artificial intelligence-based early diagnostic system for light-chain amyloidosis", currently under review by npj Digital Medicine.

Skills

- Programming Languages: Proficient in Python, Working knowledge of MATLAB and C++.
- Software Frameworks: PyTorch, NumPy, PyTorch3D, TensorFlow

Referee

Dr Nicole Salomons, Assistant Professor at Imperial College, n.salomons@imperial.ac.uk