

Puming Jiang

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[Personal Homepage](#)

Education

Imperial College London, London, UK

Master of Research

Oct 2023 – Sep 2024

- Supervisor: Dr Nicole Salomons
- Individual Research Topic: Intelligent Robotic Tutoring: Integrating Verbal Input for Personalising Learning Responses.

University of Cambridge, Cambridge, UK

MEng and B.A. in Information and Computer Engineering

Oct 2019 - June 2023

- MEng: Honours Pass with Distinction (First-Class in both modules and research project)
- B.A.: First Class Honor (15th percentile)
- Awards: Continuing Senior Scholarship; Senior Scholarship

Publications

- Co-First Author for “ImageTalk: A Multimodal AAC Text Generation System Driven by Image Recognition and Nature Language Generation”, currently under review by the IUI 2024 conference.
- Co-Author for “Development of an artificial intelligence-based early diagnostic system for light-chain amyloidosis”, currently under review by PLOS Medicine.

Research Experience

Intelligent Robotic Tutoring: Integrating Verbal Input for Personalising Learning Responses

MRes Individual Research Project, Imperial College London

Oct 2023 – Present

- Objective: Incorporate verbal input into the teaching robot to allow the analysis of spoken feedback to deliver more personalised responses to enhance the learning experience.
- Proposed Solution: Utilise LLMs to decipher student understanding, develop a modified Bayesian Knowledge Tracing (BKT) model, and refine feedback mechanisms.
 - Investigate adult learners’ progress in solving math problems.
- Proposed Publications: Planned submissions of individual papers to the upcoming RO-MAN and HRI conferences.

Develop a Novel AAC Text Generation System Powered by Image Recognition Models and LLM

Summer Research Project, University of Cambridge

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 utilised 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 existing limitations in the current system through human evaluations conducted via semi-structured interviews.
 - Proposed design guidelines for further improvement of this human-in-the-loop interaction process.
- Publication: Currently under review by the IUI 2024 conference.

Accurate and Detailed Human 3D Shape Estimation from Mobile Phone Images

MEng Individual Research Project, University of Cambridge

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 to accurately transfer body joint prediction from full-body to zoomed-in images.
 - Trained a transformer to fuse shape predictions on various body parts.
 - 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 CNN-Based Methods Applied to UAV Images

Summer Research Project, University of Cambridge

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 crown 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 minimised class discrepancies.
 - Applied regularisations to prevent overfitting; marking a significant outcome for a challenging task.
- **Publication:** Manuscript under development.

Artificial Intelligence Based Early Diagnosis System for Light-Chain Amyloidosis

Summer Research Project, Neusoft

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.
- **Publication:** Currently under review by PLOS Medicine.

Skills

- **Reviewer:** International Conference on Human-Robot Interaction (HRI) 2024
- **Programming Skills:**
 - Programming Language: Python (Proficient), MATLAB & C++ (working knowledge)
 - Software Frameworks and Libraries: PyTorch, NumPy, PyTorch3D, TensorFlow
- **Robotic Experience:** NAO robot programming and operation
- **Language:** English (Fluent), Chinese (Native)

Referee

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