Wengxi Li

CONTACT
INFORMATION

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RESEARCH
INTERESTS

Utilize human-centered design and applied AI to design, build, and evaluate human-AI systems in education, accessibility, or any everyday activities to assist and augment human intelligence.

EDUCATION

University of Michigan, Ann Arbor, MI
Master of Science in *Electrical & Computer Engineering*, GPA: 4.00/4.00   April 2023

- Coursework: Computer Vision, Computational Data Science & Machine Learning, Human-AI Interaction & Systems, SQL & Databases, Web Systems, Data Structure & Algorithms

University College London, London, United Kindom
Master of Science with **Distinction** in *Medical Image Computing*   August 2021

- Coursework: Programming Foundations for Medical Image Analysis, Machine Learning in Medical Imaging, Medical Electronics and Control

Beijing Normal University, Beijing, China
Bachelor of Science in *Physics*, GPA: 3.60/4.00   June 2020

- Coursework: Foundation of Programming Language (Java), Linear Algebra, Solidworks, Data Analysis, Electrodynamics, Quantum Mechanics, Solid State Physics

RESEARCH
EXPERIENCE

Collaborative Programming Learning: Transforming Programming Videos into Interactive Tutorials with LLMs (in preparation)

Advisor: Prof. Hariharan Subramonyam   *Stanford Institute for Human-Centered AI*

- **Cognitive Apprenticeship Pedagogy**
  - Designed a syntax tree structure that can be populated with information from programming videos, data sets, and computational notebooks.
  - The syntax tree defines appropriate cognitive apprenticeship pedagogy for skill acquisition that is adaptive to the learner's skill level
- **Intelligent Tutor System**
  - Implemented a syntax tree-embedded conversational Intelligent Tutor System (ITS) as a JupyterLab extension using TypeScript, React, and Python
  - The ITS uses LLM to generate interactions to help learners watch video tutorials in several areas of computer science, such as exploratory data analysis, machine learning, and more.

Real-time Refocusing Algorithms for Acoustic Neurostimulations   [Paper] [Poster][Code]

Advisor: Dr. Antonio Stanziola, Prof. Bradley Treeby   *Biomedical Ultrasound Group*, UCL

- **Traditional Algorithms Design and Simulations**
  - Applied the Time Reversal (TR) algorithm to simulate the ultrasonic focus movement during neurostimulation sessions and got the transmit phases of three fixed targets
  - Calculated the phase difference of the transmitted wave due to the head movements for the three targets using the Geometric Beamforming (GB) algorithm
- **Dataset Built and Deep Neural Network Training**
  - Simulated the phase difference for 50 different patients, 50 random targets for each patient,

and ten sets of transformations (including displacements and rotations) for each target
- Implemented a fully connected neural network that takes target position, head displacement and rotation as input and outputs phase difference prediction
- **Results and conclusions**
  - Traditional method: The GB algorithm works only when the focal point is at the center and the near side, so neural network prediction is necessary
  - Deep neural network: A single model for all the skulls performs poorly, so training a specific model for each skull is more effective

COURSE PROJECTS **Workers-AI Interaction for Ergonomic Solutions Applying a Vision Language Approach**
Advisor: Prof. Anhong Guo   [Report] [Talk] [Code]
- **Dataset Built and Model Fine Tune**
  - Made a dataset that has images within ten different categories (each has a specific ergonomic problem) and another script that maps each problem to a list of feasible solutions
  - Fine-tuned a Bootstrapping Language-Image Pre-training (BLIP) model on Hugging Face that could take an image as input and output a problem caption, with an accuracy of 73.39%
- **Human-AI Interaction Design**
  - To achieve human-in-the-loop, a feedback mechanism is designed that can put the user's choices and the suggestions of ergonomics experts into practice
  - In the user interaction loop, the user can select the most helpful solution from a list of solutions. The solution list will prioritize the options with the highest number of options
  - In the ergonomic expert's interaction cycle, if the user does not select any solution, the ergonomic expert will provide another solution to the list and notify the user

SERVICE **Volunteer**
UIST 2023 San Francisco, CA (**Win the T-shirt Design Contest!**)

Social Inverstigator
Microscopic survey of China's real progress (Completed **150** sample families' household surveys)

COMPUTER SKILLS
- Statistical & Back-end development: Python (Flask, PyTorch), C++, MATLAB, R, Java
- Data visualization & Front-end development: HTML, CSS, JavaScript, TypeScript, React, Vue.js

HONORS AND AWARDS

The First-Class Fellowships (Top 5%) of Beijing Normal University	2018
The First-Class Competition Scholarship (Top 5%) of Beijing Normal University	2018
Meritorious Winner (Top 7%) of Mathematical Contest in Modeling	2018