Yi LI

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EDUCATION

Purdue University — West Lafayette, IN - USA
B.S. in Computer Engineering — Expected, 12/2024

ETH Zürich — Zürich, Switzerland
Mobility Student in Computer Science — 09/2023 - 08/2024

Relevant Coursework:
Multivariable Calculus, Differential Equation, Linear Algebra, Probabilistic Methods, Discrete Math, Digital System Design, Signals and Systems, Microprocessor Systems and Interfacing, Computer Security, Neural Network Theories, Advanced C Programming, Python for Data Science, Object-Oriented Programming in C++ and Java, Data Structure, Computer Vision and Graphics, Artificial Intelligence for Digital Characters, Deep Artificial and Biological Neuronal Network, Scientific Computing

AWARDS AND HONORS

Member of USAIRE & ORAJe (Association of U.S. and European Aerospace Industry Representatives)	2024
Winner of the 19th USAIRE Aerospace & Defense International Student Competition	2024
ETH Zürich Exchange Scholarship	2023
Purdue University Dean's List	2020 - 2023

RESEARCH EXPERIENCE

Cardiovascular Monitoring through Bioelectronic Sensor | Submodule Leader — 08/2024 - 11/2024
- Recorded arterial blood pressure (ABP) during various mental activities, creating a waveform database (WFDB).
- Developed an automated preprocessing pipeline for wearable sensor data, including parsing, normalization, detrending, and denoising; designed multi-peak detection algorithms to accurately identify the primary, secondary, and tertiary peaks within each pulse, ensuring high-quality data for analysis.
- Performed Principal Component Analysis (PCA), including Kernel PCA and Sparse PCA, to analyze and validate correlations between human emotional states and ABP.

Speech Recognition and LLM-Based Aid for Aphasia Patients | Consultant — 08/2024 - 11/2024
- Developed an automated program to extract meaningful speech waveforms from aphasia patients, filtering out non-speech segments and irrelevant peaks.
- Transformed waveforms into spectrograms and optimized the Transfer Learning architecture for speech recognition, using data augmentation techniques to boost classification accuracy from 60% to 93%.
- Applied various filters, such as Mel filters, to enhance spectrogram features tailored to our unique voice sensor.

Usaire Aerospace and Defense International Student Competition | Lead Author — 04/2024 - 08/2024
- Conducted research on the feasibility of integrating artificial intelligence into Air Traffic Management (ATM) systems to improve efficiency, security, environmental sustainability, and user experience.
- Developed an innovative architecture and workflow, and evaluated a simplified Decision Transformer model to assess its potential.
- Authored a comprehensive 5,000-word paper detailing the system architecture, security mechanisms, economic benefits, rollout strategy, and societal impact.

Union of European Football Associations (UEFA) Match Analytics | Team Leader — 01/2024 - 05/2024
- Developed custom scripts to process raw tracking data and generate statistical visualizations, such as heatmaps and radial charts, to highlight individual and team performance across various metrics.

- Designed a Pitch Control Neural Network model to quantify space generation and gain during off-ball runs, evaluating players' play styles and threat levels.
- Conducted a detailed UEFA qualification match forecast and provided strategic recommendations based on statistical analysis and the pitch control model.

INDUSTRIAL EXPERIENCE

Automated Course of Action Generation Research | Team Leader 09/2024 - Present

- Built a simplified Knowledge Graph Embedding (KGE) using the Trans-E algorithm to validate initial concepts and encode decision-making rules efficiently.
- Designed and authored the technical volume for the Department of Defense (DoD) Phase 1 proposal, detailing the Hierarchical Reinforcement Learning (HRL) pipeline and its applications in general decision-making optimization scenarios.

Industrial Operational Amplifier Test Board | Submodule Developer 08/2024 - 11/2024

- Collaborated with the Naval Sea Systems Command NSWC Crane Division to discuss and improve the industrial operational amplifier (Op-Amp) testing process.
- Developed a lightweight dynamic website hosted on an ESP-32, featuring calibration and chatbot functionalities.
- Jointly designed and assembled a PCB platform to achieve efficient automated testing of operational amplifiers.
- Designed and 3D printed a protection case for the Op-Amp test board.

INVITED PRESENTATIONS

- **Yi LI, et al.** "Developing a Digital Twin for Cardiovascular Health Monitoring Using Deep Learning." *Fall Undergraduate Research Expo*, Purdue University, West Lafayette, IN, November 2024.
- **Yi LI,** "AVENIR: Artificial-Intelligence-Assisted Air Traffic Management System." *Usaire Student Awards Ceremony*, Circle of the Interallied Union, Paris, France, November 2024.

TUTORING EXPERIENCE

Academic Tutor 11/2020 - Present

- Provide tutoring for students in Purdue's Electrical and Computer Engineer (ECE) department, assisting with coursework, exam preparation, and group projects.
- Support students interested in STEM subjects, helping them build foundational knowledge and confidence.
- Summarize and present key course materials on my personal website, covering topics in mathematics and computer science.

FAA Pilot Exam Guider 05/2023 - 08/2023

- Logged over 100 hours of flight experience, specializing in Cessna 172 aircraft, and achieved a nearly perfect score on the FAA written exam.
- Created 28 chapters summarizing essential topics on my personal website, providing guidance for aspiring pilots.

Soccer Tactical Analysis Content Creator 2020 - Present

- Create engaging video content for soccer enthusiasts by using professional-grade visualizations and statistical analytics to provide deep insights and seamlessly connect real-life soccer strategies with in-game tactics.
- Achieve hundreds of thousands of views and gain recognition as a leading educational content creator within the soccer community.

Piano Tutor 2019 - Present

- Coach peers in piano performance, arrangement, and transcription.
- Publish widely shared music sheets online, gaining recognition within the piano community.

SKILLS

Computer:
MATLAB, Python (PyTorch, Pandas, Matplotlib, TensorFlow), C++/Java, C, SystemVerilog
Unity, Blender, Solidworks, Davinci Resolve/Adobe PE, STM32CubeIDE.
Language: Chinese (Native), English (Fluent), German (Intermediate)