Shaoze **Yang**

Graduate Student

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Education

University of Michigan. *Michigan, U.S.*

M.S. IN Computer and Information Science *Sept. 2023 - Pre.*

- GPA: 3.95/4.00
- Related Courses Taken (partial):
  Reinforcement Learning | Information Retrieval | Natural Language Processing | Database Application Design | SQL & Database.

University of Michigan - Shanghai Jiao Tong University Joint Institute. *Shanghai, China*

B.S. IN Electrical and Computer Engineering, MINOR IN Data Science *Sept. 2020 - Oct. 2024*

- core GPA: 3.72/4.00 rank: 39/224
- Related Courses Taken (partial):
  Data Structures & Algorithms | Adv. Computer Architecture | Design of Microprocessor Based System | Methods and Tools for Big Data.

Research

The Boeing Company - Industrial & Operations Engineering *Ann Arbor, US*

Predicting and Optimizing Workers' Trust toward Autonomous Vehicles in Manufacturing Plants *Sept. 2023 - Pre.*

- Co-supervised by Prof. Xi Jessie Yang and Al Salour, Technical Fellow at Boeing
- Formulate a vertical FSM-based algorithm boosting pedestrian behavior analysis, achieving a 12% accuracy uplift. The paper (first author) **"Identifying Worker Motion Through a Manufacturing Plant: A Finite Automaton Model"** was accepted by IEEE conference RO-MAN.
- Based on Temporal Fusion Transformer and VQ-VAE, developing trajectory prediction models. Achieve RMSE < 2m in 4s prediction.
- Analyze vast experimental data from virtual environment, ensuring real-time communication between Unreal Engine and Python model.
- Integrate ML model to Unreal Engine, enabling real-time prediction and control of AGV.
- Develop a Python-based UI (Dash/Plotly) for efficient data-labeling and data flow replay.

ARCAD Lab, Robotics Engineering *Ann Arbor, US*

Quadraped Robot Control and Embedding System Development *Oct. 2023 - Pre.*

- Supervised by Prof. Yanran Ding
- On the Anymal robot, deploying teacher-student architecture to accelerate the training process of reinforcement learning model
- Under development: (Sim2Real) based on Unitree Go2 model, communicate with robot PC through Ethernet port and Unitree SDK
- Engineered and tested a Dynamometer to serve as the motor-testing platform. Developed a control framework facilitating seamless communication between computer, voltmeter, oscilloscope, and torque sensor.
- Research on the mechanism and control of Brushless DC motor, deploying PID algorithm for high-bandwidth feedback control.

SJTU AI Institute *Shanghai Jiao Tong University*

Style Analysis of Chinese Landscape Painting Based on Artificial Intelligence *Dec. 2021 - Jul. 2023*

- Developed a novel hierarchical model for the restoration of Chinese landscape paintings, effectively preserving fine-grained brushstrokes and artistic styles. Co-first author of paper titled **"Hierarchical Painter: Chinese Landscape Painting Restoration with Fine-grained Styles"** was published at journal Visual Intelligence.
- Led the design and experimentation of a segmentation-based detail generation model, enhancing the consistency and authenticity.

Experience

Motion Control Engineer Intern (MLE) *SJTU, Shanghai, China*

DEEP Robotics *May.2023 - Aug.2023*

- Migrate "Agile but Safe" to Lite3 robot. Implement a hierarchical DRL model for motion control. **[Github Repo]**
- Reproduce deep tracking control, combining MPC-based and terrain-aware foothold planner with DRL-based motion control. Achieve robust control on extreme risky terrains. Investigate appropriate terrain encoders and reward functions.
- Modifying PPO algorithm, adding advanced features such as terrain encoder(GRU+LSTM) and symmetric data argumentation.

Quantitative Trading Data Analyst Intern *Shanghai, CN*

Asset Pro *Feb.2023 - May.2023*

- Conducted in-depth research and successfully replicated mainstream fundamental factors.
- Explored correlation network factors, analyzing stock relationships from various perspectives, achieving an average 20-day increase of 3% through single-factor analysis.
- Responsible for researching the data quality of data suppliers, successfully replicating upstream and downstream industry relationship chain factors.

Projects

EV Charging Station Recommendation System

University of Michigan

Programmer

Sept. 2023 - Dec. 2023

- **Data scraping** using GoogleMap | Serp | NREL API.
- **NLP** comments using ChatGPT API & **prompt engineering**.
- LLM-based embedded vector space **personalization**.
- Item-item **reasoning** based on Collaborative Filtering & Relevance Matrix.
- **"Learn to Rank"** using LightGBM, automatic pesudo-label generation using ChatGPT & GoogleMap API.
- Integrated mainstream rankers such as **BM25**(core feature of Bing), TF-IDF, Pivoted Normalization, DirichletLM.
- **MEM-efficient** data structure based on inverted index
- **User Interface** based on Flask, GoogleMAP API
- Project on Github: **PlugStation-Recommendation-System**.

2-Wheel Self Balanced Robot

Shanghai Jiao Tong University

Embedded System Programmer & Mechanical Designer

Sept. 2023 - Dec. 2023

- Deploy the **Linear Quadratic Regulator & PID** control algorithm for self-balancing.
- Design **PCB** for IO expansion and adapt to various peripherals.
- Realize efficient communication using **CAN Bus**.
- Integrate safety alerting using PWM & Buzzer and Battery monitoring using ADC.

Remote Control Mars Rover with Variable Chassis

Shanghai Jiao Tong University

Team Leader & Programmer & Mechanical Designer

Jul. 2021 - Aug. 2021

- Reproduce the classical mechanical chassis structure of **Curiosity, NASA**.
- Realize the function of automatic obstacles' avoidance.
- Realize the function of variable steering strategy.
- Finite element analysis for critical component.
- See portfolio page for details: **Mars' Rover**

Hex-crab, unmanned seabed landform detector

Shanghai Jiao Tong University

Structure Designer & Algorithm Programmer

Nov. 2021 - July. 2022

- Realize the structure model of multi-legged bio-robot.
- Reproduce the gait strategy from another python project.

Skills

Programming	C, C++, Python, Java, HTML, CSS, JavaScript, Matlab, Verilog.
Digital Media	Photoshop, Premiere, After Effects, Illustrator, Audition, Final Cut Pro, Davinci.
Tools	SolidWorks, Mathematica, PyTorch, NumPy, Pandas, Dash, Flask, Git, LaTeX.
Languages	Mandarin(native), English(TOEFL 104).
Others	Photography, Violin(Level 10), Travel & Pedestrianism

Extracurricular Activity

VEX U Community (Robotics Competition Team)

Shanghai Jiao Tong University

Member of Mechanical Group and Advocacy Group

Oct. 2020 - May. 2023

- Mechanical structure designer of chassis, 20-21 Season. World record holder.
- Revealing and Instruction videos producer of 20-21 & 21-22 Season, accumulating 80k+ plays.

High-level Art Troupe

Shanghai Jiao Tong University

Associate Violin Concertmaster & Member of Orchestra

Oct. 2020 - Apr. 2023

- Participator of Long Marcd Song Sycle Performance
- Participator of New Year Concert, 20 Winter.
- Participator of School Welcome Concert, 21 Fall.

Honors & Awards

Jul. 2024	**The Lums fellowship, $30k USD (Top 3%),** Graduate Students	*Ann Arbor, MI*
Apr. 2024	**Outstanding graduates of Shanghai (Top 3%),** Undergraduate Students	*Shanghai*
July. 2023	**GDP Explorer Scholarship (Top 5%),** Undergraduate Students	*UM-SJTU*
Nov. 2022	**John Wu & Jane Sun Sunshine Scholarship (Top 5%),** Undergraduate Students	*UM-SJTU*
Oct. 2022	**President's Award**, Member of Orchestra, High-level Art Troupe	*Shanghai*
Sept. 2022	**Golden Prize**, "Internet+" Innovation Entrepreneurship Competition	*Shanghai*
May. 2021	**Champion of Skill Competition**, VEX U, Season 20-21	*Shanghai China*
Apr. 2021	**First Prize**, Asia Open, VEX U, Season 20-21	*Xian, China*