Chenwan Zhong

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EDUCATION

BEIJING JIAOTONG UNIVERSITY (BJTU) Beijing, China

Bachelor of Engineering in Mechatronics (GPA: 3.01/4.00) *Sep 2020– Jul 2024 (expected)*

- **Relevant Coursework**: Machine Vision Based Measurement Technology, Design of Intelligent Mechatronic Control System, Error Theory and Data Processing, Fundamentals of Robot Technology, Electrotechnics
- **Honor**: First-Class Research and Innovation Scholarship (top 5%, 2023), Advanced Individual in Social Practice (2022), First-Class Academic Scholarship (top 15%, 2021)

RESEARCH EXPERIENCE

AI Agent: Automated Robot Learning via Generative Simulation Beijing, China

Researcher at Future Lab, Tsinghua University, Advisor: Prof. Haipeng Mi *Dec 2023– present*

- Proposed and currently developing a pioneering cross-domain transfer learning framework using virtual reality (VR) technology to enhance the generalization and diversity of robotic skills, addressing challenges related to data limitations and domain discrepancies in the field of robotic learning

Optimization of an Intelligent Robotic Navigation System: Addressing Complex Environments Singapore

*Research Assistant at Institute for Infocomm Research, A*STAR, Advisor: Dr. Jun Li* *Sep 2023– Nov 2023*

- Integrated YOLOv8 and ORB-SLAM2 to improve the robot navigation system, resulting in a 20% improvement in real-time location accuracy in complex environments
- Developed intelligent path planning strategies that reduced navigation time by 15% and increased robot navigation speed from 0.5 to 0.6 meters per second in indoor settings
- Enhanced the robot's navigation capabilities in dynamic and complex environments by reducing the average location error from 1.5% to 1.2%

Resilient HVAC System: Application of Data-Driven Models and Energy Simulation Technologies Singapore

Research Assistant at Nanyang Technological University, Advisor: Prof. Chau Yuen *Jul 2023– Sep 2023*

- Processed and analyzed extensive datasets from real-world commercial buildings, including information about cooling tower and chiller power consumption, identifying the key input variables for the model
- Assisted in creating a thermal mapping model employing GNN to predict energy consumption in HVAC systems, demonstrating a mere 8% average error rate for incomplete data scenarios
- Constructed intricate energy simulation models for large building HVAC systems by using Modelica and EnergyPlus, resulting in demonstrable simulation tests that showcased an outstanding reduction in energy consumption of up to 15%

INTERNSHIP

Lenovo Research Beijing, China

Department of Human-centered Innovation Intelligence and Insights, Supervisor: Jingwei Sun *Nov 2023– present*

- Developed a Unity-based demo for virtual hand-object interaction within the naked-eye 3D display interactive gaming system; integrated Leap Motion with monocular camera, enabling precise gesture control across the XYZ axes contributing to a 15% rise of user satisfaction within the test group
- Validated multiple SDK-inherent gesture effects, successfully executing complex operations in simulated scenarios, resulting in an average 30% reduction in interaction time for users within the test group
- Identified and innovated on gestures necessitating further development post metadata acquisition, devising 6 custom gestures and operational logic, expanding the interaction repertoire and complexity

Beijing Benz Automotive Co., Ltd. (BBAC) Beijing, China

Research and Development Center, Supervisor: Tao Yang *Apr 2023– Jul 2023*

- Designed and analyzed Electronic Control Units (ECUs) for vehicle power and safety systems, resulting in a 12% increase in system response and a collision detection accuracy rate of 95%
- Conducted performance verification tests to ensure the engineered sensor functionality met predefined quality standards and contributed to the vehicle's reliability and safety
- Drafted detailed documentation and protocols for the integration of sensors and actuators, encompassing integration specifications, data communication formats, and interface requirements

PROJECTS

Comprehensive Service Robot Design Based on ROS
Course Project, Advisor: Prof. Yancai Xiao *Jun 2023*

- Programmed a service robot using ROS to map the corridors of a five-story building and an indoor laboratory through SLAM, visualized the maps in RViz, and applied color-coded zones for environmental interpretation
- Developed voice control using ROS's Speech Recognition module and Google's speech recognition API, enabling command recognition and implementing CNN models for audio feature extraction
- Developed autonomous navigation for office locations utilizing MapTools, engineered obstacle avoidance tactics, and constructed interactive follow-and-monitor systems with voice-activated counting on the ROS platform

Interactive Oropharyngeal-Swab Robot System Design for COVID-19 Pandemic
National Level Student Research Training Program (SRTP), Advisor: Prof. Yancai Xiao *Apr 2022– Apr 2023*

- Led system planning and design for a robotic swab sampling system, integrating mechanical, gesture, and visual modules, and developed a mobile app for efficient user data management; achieved completion of one throat swab sampling process within 42 seconds
- Developed a gesture recognition model based on Leap Motion to facilitate user control over sampling progress, integrating SVM and LSTM, achieving a gesture recognition of 95% accuracy and reducing response time to 1.5 seconds per sampling action

Quadruped Robot Design for Search and Rescue
Course Project, Advisor: Prof. Guanrong Chen *Jun 2022*

- Designed and developed a quadruped robot by integrating an STM32 microcontroller with various sensors to enable the performance of tasks such as navigating through mazes, and overcoming obstacles in various scenarios
- Developed precise gait planning algorithms and advanced motion control strategies, and repeatedly conducted simulations and field tests to ensure the robot's continuous stable motion on slopes and uneven terrain
- Implemented track-keeping functionality using grayscale sensors, allowing the robot to accurately follow predefined paths and fine-tuned the height limitation function to an accuracy of ±2 centimeters

Smart Kitchen: Automatic Seasoning Dispenser System Design
Provincial Level Student Research Training Program (SRTP), Advisor: Prof. Tao He *Apr 2021– Apr 2022*

- Engineered an automatic seasoning dispenser to integrate sensor technology for measuring and dispensing culinary seasoning, thereby eliminating common seasoning errors made by inexperienced cooks
- Designed a sensor scheme based on photoresistors to monitor the remaining level of seasoning in transparent containers, integrating the photoresistors with microcontroller and writing corresponding code to interpret the analog voltage signals from the sensors
- Designed and implemented communication protocols between different components, allowing the microcontroller to communicate with devices using the I2C protocol, facilitating the exchange of data and control commands

SKILLS & INTERESTS

Laboratory Techniques: 3D printing, Circuit Design & Soldering, Laser Cutting, CNC Machining
Programming: C, C++, CSS, HTML, JavaScript, MATLAB, Python
Languages: Chinese (native), English (fluent), Spanish (fluent), French (basic), German (basic), Russian (basic)

LEADERSHIP & SERVICE

Technical Support Volunteer at 2022 World Conference on VR Industry *Nov 2022*

- Assisted with organizing workshops and lectures on VR technology, documenting conference proceedings and discussions, providing technical support to address inquiries related to VR devices and applications

Team Leader & Car Body Designer of Green Pulse Race Car Team of BJTU *Nov 2020– Present*

- Engineered aerodynamically optimized car bodies for the team, resulting in a 10% increase in efficiency and an additional 20 kilometers' travel distance compared to competitors in the Shell Eco-marathon (an international efficiency competition encouraging ultra-efficient vehicle design to travel the farthest on limited energy); our team won third place in 2021 and second place in 2022 respectively in the said competition

President & Lead Vocalist of LAMP Music Society of BJTU *Nov 2020– Present*

- Planned and executed five successful music-related events, including concerts, competitions, and shows, attracting audiences of over 3,000 and raising more than $7,500 in total
- Contributed to the creation of original music and delivered outstanding performances during live events