PEIYI LIU

Email: peiyiliu@usc.edu Address: 325 W. Adams Blvd, Los Angeles, CA Cel:

EDUCATION

University of Southern California, Los Angeles, CA Jun. 2026(expected)
M.S. in Mechanical Engineering GPA:

China University of Petroleum – Beijing at Karamay, Xinjiang, China Jun. 2024
B.S. in Process Equipment and Control Engineering GPA: 3.7/4.0

TECHNICAL SKILLS

Programming Languages: Java, JavaScript, SQL

PROJECTS

Path Planning for Vehicle Pickup Based on Q-Learning Xinjiang, China
[Researcher & Robot Designer] Mar. 2023

- Studied MATLAB, bio-inspired robotics, robot designs and architectures, robot trajectory planning and search, and evolutionary algorithm
- Applied robot playground package and robot playground expansion package to establish a maze environment, simulated the operation of the bio-inspired robot, and improved the parameters of robot controller
- Designed the dynamic map environment model using cyclical function
- Trained the intelligent trolley many times until the trolley obtained a good convergence effect using the Q-learning algorithm for path planning
- Completed the design that the trolley successfully picked up garbage from the starting point and reached the end point without colliding with obstacles throughout the process

Mechanical Design of Belt Conveyor - Single Cylindrical Helical Gear Reduction Xinjiang, China
[Student Researcher] Feb. 2023 – Mar. 2023

- Determined the total transmission ratio and distribution transmission ratio of the transmission device, the kind, efficiency, and capacity of the motor, and its overall design scheme
- Calculated the dynamic parameters, designed V-belt transmission, reducer gear transmission, mastered gear type, precision grade, material, and number of teeth
- Designed the drive shaft, drive bearing, and coupling, completed the selection and calculation of the bearing and key coupling, the calculation of the main structural dimensions of the reducer accessories, and the box

Intelligent Mechanical Body Based on Bionic Technology and Robotics Xinjiang, China
[Student Researcher] Dec. 2022 – Feb. 2023

- Completed lectures on biologically inspired robotics by explaining the underlying principles of biology and robotics with case studies of modern biological discoveries driven by biological mechanisms and engineering
- Mastered fundamental applications of actuation, sensing, rigid/soft robots, locomotion (walking and swimming), manipulation, and robot learning and evolution
- Discussed the technological limitations of current robotics technologies and prospects of future development

Magnetic Bearing: State-of-the-Art and Future Research Directions Xinjiang, China
[Student Researcher] Sept. 2021 – Oct. 2021

- Reviewed the application of magnetic bearing in the fields of aerospace, mechanical industry, and life science
- Discusses two types of magnetic bearing, including High-Temperature Superconductor Magnetic Bearing (HTSMB) and Power Magnetic Bearing (SMB)

- Analyzed the technical properties of magnetic bearings and examined how they developed
- Concluded that high-performance materials and the stability of system structures should be the main improvement directions
- Suggested that the future additional research be done on modeling techniques and rotor qualities that become unstable at high speeds

Energy Conversion Technology and Applications Xinjiang, China
[Student Researcher] Jul. 2021 – Sept. 2021

- Completed the online research lectures on electrical-mechanical-magnetic energy conversion technology, thermal-electrical energy conversion technology, optical-electrical energy conversion technology, energy storage technology and energy transmission technology
- Focused on learning electromagnetic motors, electrostatic field motors, low-temperature waste heat power generation technology, and energy storage and transmission methods and technologies

PUBLICATIONS

- P. Liu, Y. Liu, & Q. Shen, "*Magnetic Bearing: State-of-the-Art and Future Research Directions*" in 2nd Annual International Conference on Mechanical Engineering, Intelligent Manufacturing, and Automation Technology [MEMAT2022], Guilin, Guangxi, China, 2022
- P. Liu, "Q-Learning: "*Applications and Convergence Rate Optimization*" in 5th Annual International Conference on Mechanics, Simulation, and Control [ICMSC 2023], San Jose, Californica, USA, 2023

ACTIVITIES

Youth Volunteers Association Xinjiang, China
[Youth & Volunteer Officer] Mar. 2021 – Mar. 2 0 2 2

- Prepared for monthly and annual statistical reports, such as budget planning, performance reports, and annual volunteer recruitment reports
- Managed volunteer database to arrange volunteer activities and visits in needy villages and regions
- Collected and updated records of volunteers for awards presentations and assignments in their activities
- Fundraised for the underprivileged regions in Xinjiang to offer educational support for local schools

Student Science and Technology Association Xinjiang, China
[Member of Association] Sept. 2020 – Jul. 2024 [Anticipated]

- Worked in a diverse team setting with student backgrounds undertaken the role of a student assistant to support the researched, development, and generated coding of new and existing algorithms
- Applied tools and technologies to meet data-intensive and data-driven science challenges

AWARDS & HONORS

- Asia and Pacific Mathematical Contest in Modeling (APMCM) 3rd Prize (Top 25%) Nov. 2 0 2 2
- Excellent Undergraduate Student in Scientific and Technological Innovation Nov. 2 0 2 2
- China University of Petroleum – Beijing at Karamay 2nd Class Scholarship Sept. 2 0 2 2
- Huashu Cup China Undergraduate Mathematical Contest in Modeling – Excellence Award Aug. 2 0 2 2
- China University of Petroleum – Beijing at Karamay 2nd Class Scholarship Sept. 2 0 2 1