Zhijun ZHUANG

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EDUCATION

Shanghai Jiao Tong University (SJTU) ***Shanghai, China***
Bachelor of Mechanical Engineering *Sep. 2017 - Present*

- **Overall GPA: 3.7**/4.3 (**87**/100), **Ranking: 27**/161

Selected Coursework: Mechanical Dynamics (**A**), Deep Learning Practice(**A**)

- **Languages: IELTS**: **7.5**/9.0 **GRE**: **325+3.5**(AW)

Selected Honors & Activities

- First Prize of the Ninth National College Mechanical Innovation Competition(1%), China
- First Prize of Design and Manufacturing Exhibition in 2019(2%), Shanghai Jiao Tong University
- Vice President of the Art Center, Student Union, Shanghai Jiao Tong University

RESEARCH EXPERIENCE

Design and Strategy Optimization of an Air Hockey Robot **SJTU, *China***
Team Co-Leader, Supervisor: Xinjun SHENG, Xinyi LE *Sept. 2019 - Present*

- **Mechanical Structure and Electronic Control System**
  Designed a real-time vision capture system for the localization and trajectory prediction of the puck.
  Created a two-link parallel mechanism instead of an XY-axis cross slide to reduce cumulative error.
  Proposed an S-curve acceleration algorithm to improve the stability of stepper speed control.
- **Strategy Optimization of the Robot through Reinforcement Learning (RL)**

Modeled the table air-hockey game in simulation and optimized the attack-defense strategy of the robot with RL.

Incorporated Prioritized Replay DQN, Dueling DQN, and Noisy Net to improve final performance.

Introduced an AI to collect positive experience as a warm-up to speed up training, and vectorized the environment's physical information as an improved embedding to make the sim-to-real transfer easier.

In progress: apply the learned policy to the real robot.

Physically-based Simulation and Optimization of a two-DOF Chaotic Pendulum **SJTU, *China***
Research Assistant, Supervisor: Genliang CHEN *Dec. 2019 - Mar. 2020*

- Computed both forward kinematics and inverse kinematics and visualized the motion of a two-DOF chaotic pendulum.
- Implemented genetic algorithm to optimize the structure of the pendulum for long-lived motion.
- Justified the conclusion through manufacturing a scale model.

Research and Development of Smart Car Slam with Lidar and Binocular Vision **SJTU, *China***
Research Assistant, Supervisor: Bin WANG *Jul. 2018 - Sept. 2018*

- Implemented the range-measurement system by binocular vision on an intelligent car.
- Analyzed SIFT algorithm in-depth, extracted the region of interest to improve the efficiency by almost 30% in detecting and matching feature points.

Skill

- Programming: Python, R, C/C++
- Tools: MATLAB, Latex, Solidworks, Adams