LI Sen | 李森

senli.edu@gmail.com

EDUCATION

Guangdong University of Technology — Guangzhou, China
M.E. Control Science and Engineering — Sept. 2019 - Present
- GPA: 3.96/5.0, top 3.8%.

Guangdong University of Technology — Guangzhou, China
B.E. Electronic Engineering — Sept. 2015 – June 2019
- GPA: 3.88/5.0, top 1.6%.
- Admission into postgraduate exempt from examination.
- Dissertation: *Research on algorithm of cooperative work of Dual Six-Axis Manipulator. [Video]

Xbotpark & Guangdong U of Tech — Songshan Lake, Dongguan, China
Minor: Joint College of Robotics — Sept. 2017 – June 2019
- Guang Dong and Hong Kong Joint College of Robotics

PUBLICATIONS

[1] Zhifeng HUANG, Sen LI, Jungao JIANG, Ying WU, Liang YANG, and Yun ZHANG, **"Biomimetic Flip-and-Flap Strategy of Flying Objects for Perching on Inclined Surfaces",** [J]. *IEEE Robotics and Automation Letters,* (DOI: 10.1109/LRA.2021.3070254) [PDF], [Video], (Published).

RESEARCH PROJECTS

Determinants of Robotic Wall-Flip Strategy — Dec. 20 - Present
Supervisor:Associate Prof. HUANG Zhifeng Jet Power & Humanoid Robotics Lab
- Brief Description: The key metric for the robot to perform a wall-flip parkour motion is investigated through movements of parkour practitioners. By taking advantage of dynamics, and by knowing the geometry and contact properties of the environment, the locomotion performance of the robot is vastly improved over that by more conventional locomotion.
- Responsibilities: Implement a simplified model, and discuss the determinants to facilitate analysis and feedback control design of robotic wall-flip strategy. Develop dynamic simulations of the multi-link robot (Atlas) in PyBullet to further validation.

Flying Objects Perching on Inclined Surfaces [1] — May 20 - Dec. 20
Supervisor:Associate Prof. HUANG Zhifeng Jet Power & Humanoid Robotics Lab
- Brief Description: A flip-and-flap biomimetic strategy is presented that enables a high-speed flying object to perch on inclined surfaces without speed reduction before touchdown.
- Responsibilities: Analyzed the motions of flying objects by building mathematical model which simulated the flip-and-flap process; Performed progressed analysis and compiled the paper for publication.

Cooperative work of Dual Six-Axis Manipulator* — Aug. 18 – June 19
Supervisor: Dr. WANG Hong Xbotpark
- Brief Description: Designed an algorithm of how the slave manipulator follows the master manipulator and how the slave manipulator independently performs trajectory overlay.

- Responsibilities: Completed the simulation of position and attitude planning algorithms, and design the trajectory tracking and trajectory overlay algorithm.

Gesture Control of Moving Chassis [Video] June 17 – Aug. 17
- Xbotpark

- Brief Description: Using a customized data glove controls the Mecanum wheel cart moves in all directions by gesture.
- Responsibilities: Implemented the chassis program development, including driving the chassis and decoding the remote control.

ROBOCON [Video] Nov. 15 – June 17
- College of Robotics, GDUT

- Brief Description: Two robots on top of the previous badminton robot were designed for two consequetive National University Robot Competitions , "Clean energy recharging the world" and "Asobi: the landing disc", to further polish my engineering skills.
- Responsibilities: Participated in the design of badminton robot, clean energy robots, frisbee robot, and serve as the operator of the badminton robot. Mainly responsible for the control of the chassis of the mecanum wheel and the control of the launcher.

ADVANCED COURSES

TMP2750 Computer Vision 18 Spring Semester
Project: Rock–Paper–Scissors based on vision. [Video] Xbotpark

- Dynamic gesture tracking and recognition program that recognizes opponent's hand gestures in the "rock-paper-scissors" games based on image classification technique, and instantly responds to defeat human players. [Score 94%]

TMP8133 Real Analysis 17 Fall Semester
Lecturer: Prof. HU Jishan (HKUST) Xbotpark

- The course covers basic topology, numerical sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, etc. [7th Score among 74 students]

TMP2606 Robotics 17 Fall Semester
Lecturer: Dr. WANG Hong (QKM Technology) Xbotpark

- Have learned rigid body motion, manipulator kinematics (POE), robot dynamics and contorl, tool center point calibration, trajectory planning in this course and designed and implemented an experiment on QKM SCARA to make pangram puzzle. Served as a teaching assistant and assisted the lecturer in grading exam papers and project oral defending. [Score 95%, A+]

PROFESSIONAL EXPERIENCE

Coordinate Measuring Machine (CMM) Project [Video] June 19 – Aug. 19
Research Assistant Robotics Institute, HKUST

- Brief Description: This project is to realize the precise positioning and processing of the workpiece. Given a template file or coarse position of the workpiece, the CMM could output the precise measuraments of the workpiece by sampling point clouds automatically generated on the workpiece's surface.
- Responsibilities: Design algorithms to automatically generate measurement path on the surface of the workpiece by collected a few sampling data. The measurement was performed with errors less than 2 μm.

HKUST One Million Dollar June 18 – July 18

Teaching Assistant — Xbotpark

- Organizer: HKUST & Shenzhen Inovance Technology Co., Ltd
- Brief Description: Robotics startups – Ten entrepreneurial teams from 30 renowned institutions, came to Beijing to present their projects and roadshows.
- Responsibilities: Discussed and determined the course schedule with YUAN Ye, LIU Jun and LIU Song, assisted professors in giving lessons, led visits to well-known companies (DJI, Inovance Technology), helped students complete prototype designs and advance their projects.

AWARDS

Student Awards

- First-class scholarship and Excellent Student (Four times) 16 - 19
- Outstanding Student Leader (Three times) 16 - 18

Contest Awards

- College Students' Innovative Entrepreneurial Training Plan Program 18
  - Organizer: Ministry of Education of China
  - Province-level funded project, NO. 201811845089, as Team Member.
- ROBOCON 2017, National Competition South Division, Third Prize 17
  - Organizer: ABU (Asia-Pacific Broadcasting Union)
  - As Team Member.
- ROBOCON 2016, Excellence Award 16

TECHNOLOGY SKILLS

Programming Languages: Python, C/C++, MATLAB.