

# HANG YUAN

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## EDUCATION

### **Xi'an Jiaotong-Liverpool University (XJTLU)**

Year 3 | Major in Mechatronics and Robotics Systems

#### **Honours & Awards:**

- The 1<sup>st</sup> Prize of 2022 RoboMaster University Championship in the 21<sup>st</sup> National University Robot Competition *National Regional* 2022-2023
- The 1<sup>st</sup> Prize of 2022 RoboMaster University Championship in the 21<sup>st</sup> National University Robot Competition *Eastern China Regional* 2022-2023
- The 1<sup>st</sup> Prize of 2022 RoboMaster University Championship in the 21<sup>st</sup> National University Robot Competition *Standard Robot Strength Award* 2022-2023
- The 2<sup>nd</sup> Prize of 2022 RoboMaster University Technical Challenge in the 21<sup>st</sup> National University Robot Competition "Standard Racing and Smart Firing" *Eastern China Regional* 2022-2023
- The 3<sup>rd</sup> Prize of 2022 RoboMaster University Technical Challenge in the 21<sup>st</sup> National University Robot Competition "Standard Racing and Smart Firing" *National Regional* 2022-2023
- The 2<sup>nd</sup> Prize of 2021 RoboMaster University Championship in the 20<sup>th</sup> National University Robot Competition *South China Regional* 2021-2022
- The 2<sup>nd</sup> Prize of 2021 RoboMaster University Technical Challenge in the 20<sup>th</sup> National University Robot Competition "Standard Racing and Smart Firing" *National Regional* 2021-2022
- The 3<sup>rd</sup> Prize of 2021 RoboMaster University Championship in the 20<sup>th</sup> National University Robot Competition *National Regional* 2021-2022
- The 1<sup>st</sup> Prize of 2021 China Engineering Robotics Competition and International Open Championship Vision Robotics Project Vision Robot Recognition Competition (Undergraduate) Project Competition 2021-2022
- The 2<sup>nd</sup> Prize of 2022 RoboMaster University League (Jiangsu Province) 3V3 Confrontation in the 21<sup>st</sup> National University Robot Competition 2022-2023
- The 2<sup>nd</sup> Prize of 2021 RoboMaster University League (Jiangsu Province) Standard Robot Confrontation in the 20<sup>th</sup> National University Robot Competition 2021-2022
- The 3<sup>rd</sup> Prize of 2021 RoboMaster University League (Jiangsu Province) 3V3 Confrontation in the 20<sup>th</sup> National University Robot Competition *Sentry Robot Strength Award* 2021-2022
- The 3<sup>rd</sup> Prize of the 8<sup>th</sup> China International "Internet+" Student Innovation and Entrepreneurship Competition 2022-2023
- The 3<sup>rd</sup> Prize of the 8<sup>th</sup> "Internet+" Student Innovation and Entrepreneurship Competition (Jiangsu Province) 2022-2023
- The 3<sup>rd</sup> Prize of the 12<sup>th</sup> "Challenge Cup" Student Entrepreneurial Plan Competition (Jiangsu Province) 2022-2023
- The 3<sup>rd</sup> Prize of 2022 Changzhou "International Intelligent Manufacturing" Innovation and Entrepreneurship Competition Robotics and Intelligent Hardware Challenge 2022-2023
- The 3<sup>rd</sup> Prize of 2022 China-U.S. Young Maker Competition Suzhou Division (6/77) 2022-2023
- The Excellence Award and the Best Popularity Award of Yangtze River Delta (YRD) Intellectual Property Innovation and Application Competition 2022-2023
- The 1<sup>st</sup> Prize of XJTLU Global Entrepreneurial Dream-chasers Competition 2022-2023
- The No. 1 in China "Internet+" Student Innovation and Entrepreneurship Competition of XJTLU 2022-2023
- The No. 1 in China "Internet+" Student Innovation and Entrepreneurship Competition of XJTLU 2021-2022

## RESEARCH EXPERIENCES

### **Research on microfluidic field**

**01.2022-Current**

XJTLU Intelligent Microsystems Laboratory

XJTLU research assistant and SURF project member

*Supervisor: Pengfei Song & Quan Zhang*

- Engaged in the field of microfluidic research, using centrifugal devices to assist biological detection
- Design and manufacture of machines, test strips, and sample solutions for lateral flow immunoassays (LFIA) to achieve increased biological detection sensitivity
- Write a review of the *C. elegans* sorting using microfluidic devices

### **Research on Humanoid Robot and Bionic Robot**

**10.2021-10.2022**

XJTLU research assistant

*Supervisor: Min Chen & Quan Zhang*

- Arrange robotic action sets and display processes
- Design and build simple humanoid robots using 3D printing, Arduino, steering gear, *etc.*

### **Research on Parametric and Lightweight Design of Free Shape Exoskeleton**

**05.2021-09.2021**

XJTLU Summer Undergraduate Research Fellowships (SURF) Project

SURF project volunteer

*Supervisor: Min Chen*

- Use simulation software ANSYS (workbench) in designing exoskeletal robots to implement parameterization
- Completed the mechanical part and the biped robot technical report and participated in a national robot competition

### **Research based on 20<sup>th</sup> and 21<sup>st</sup> ROBOMASTER National University Robot Competitions**

**11.2020-10.2022**

XJTLU Embedded Artificial Intelligence Hardware Universities-Enterprises Joint Key Laboratory

Mechanical Group Member-Sentry developer/ Investment Manager

*Supervisor: Chun Zhao*

- Developed and designed the whole sentry robot and the chassis drawings of the engineering robot in RoboMaster
- Improved quick disassembly structure and Single muzzle head
- Took charge of the team's investment (Received sponsorship totaling 60,000 RMB in 2022)

## PUBLICATIONS

[1] **Yuan H.**, Zhang W. (2019) A Novel Hedgehog-Inspired Pin-Array Robot Hand with Multiple Magnetic Pins for Adaptive Grasping. In: Yu H., Liu J., Liu L., Ju Z., Liu Y., Zhou D. (eds) *International Conference on Intelligent Robotics and Applications (ICIRA)* 2019. Lecture Notes in Computer Science, vol 11744. Springer, Cham. [https://doi.org/10.1007/978-3-030-27541-9\\_56](https://doi.org/10.1007/978-3-030-27541-9_56).

[2] **Yuan H.** Research Status and Prospects of Adaptive Robotic Hands. *Science and Technology & Innovation*, 2019(04):10-11+15. doi: 10.15913/j.cnki.kjycx.2019.04.010.

[3] Zhu, J., **Yuan, H.**, Zhang, Q. et al. (2022) The impact of short videos on student performance in an online-flipped college engineering course. *Humanities and Social Sciences Communications* 9, 327. <https://doi.org/10.1057/s41599-022-01355-6>.

[4] Yuan, W., **Yuan, H.**, Jiao, K. et al. (2023) Facile Microembossing Process for Microchannel Fabrication for Nanocellulose-Paper-Based Microfluidics. *ACS Applied Materials & Interfaces*, 15(5), 6420-6430. <https://pubs.acs.org/doi/10.1021/acsami.2c19354>.

[5] **Yuan, H.**, Yuan, W., Duan, S. et al. (2023) Microfluidic Assisted *Caenorhabditis elegans* Sorting: Current Status and Future Prospects. *Cyborg and Bionic Systems*. <https://spj.science.org/doi/10.34133/cbsystems.0011>.

[6] Song, P., Ou, P., Wang, Y., **Yuan, H.** et al. (2023) An ultrasensitive FET biosensor based on vertically aligned MoS<sub>2</sub> nanolayers with abundant surface active sites. *Analytica Chimica Acta*, 341036. <https://www.sciencedirect.com/science/article/pii/S000326702300257X>.

## PATENTS

[1] **Hang Yuan**, Wenzeng Zhang. Adaptive robotic hand device for force-controlled rapid gripping of pole gripper groups; CN109571539A[P]. 2019.

[2] **Hang Yuan.** Hedgehog-like magnetic drive rod ball adaptive robotic hand device:, CN109397278A[P]. 2019.

[3] **Hang Yuan.** A magnetic drive linkage leveling robot hand device:, CN109531610A[P]. 2019.

## INTERNSHIP EXPERIENCES

*Summer internship, Suzhou Non-Fish Cultural Media Company Limited* **08.2021-09.2021**

- Deep exposure to industrial robots, AGVs, AR/VR/MR real-scene applications and project planning
- Communicate with suppliers and make working memos to provide reasonable purchasing solutions

## EXTRACURRICULAR ACTIVITIES

*President & Liaison Minister, XJTLU Sagittarius Astronomy Club* **03.2021-03.2022**

- Planned and organized astronomical observation activities, obtained “2022 Best Cooperation Club”
- Gave lectures on astronomy to high school students of XJTLU-affiliated schools

*Vice President, XJTLU Tea Club* **12.2020-12.2021**

- Planned and prepared event proposals on the theme of tea

*Liaison Minister, XJTLU G-Master Robot Club* **03.2021-03.2022**

- Designed and organized activities related to intra-school robot battles

*Project Leader, XJTLU College student entrepreneurship project-Inkless* **05.2021-05.2022**

- Write part of business plan and do roadshow presentation
- Provide technical support and operation of projects with 3D printing

*Project Leader, XJTLU College student entrepreneurship project-ESGrow* **05.2022-05.2023**

- Founded Yuanhe Technology (Changzhou) Co., Ltd. with the support of Changzhou Wujin district government
- Provide technical support for urban farm intelligent solutions

*Corporation & Executive Director, Yuanhe Technology (Changzhou) Co., Ltd.* **10. 2022-Current**

*Student lecturer, XJTLU Optional Course* **03.2021-12.2021**

- Y1S2 & Y2S1 Unlocking robotic hands optional course
- Taught students the basics of mechanical and robotic hands

*Student Mentor, XJTLU-Affiliated school* **09.2021-08.2022**

- Teach astronomy, tea art, incense, robotics, 3D printing, etc.

*Outstanding Class Buddy, XJTLU* **03.2022-03.2023**

*Outstanding Student, XJTLU* **12.2021-12.2022**

*Outstanding Class Cadre, XJTLU* **09.2020-07.2021**

*Excellent Student Cadre, XJTLU* **12.2020-12.2021**

*Excellent Student Cadre, Jiangsu Province* **05.2022-05.2023**

*Entrepreneurship Star, 2022 XJTLU i-Star* **05.2022-05.2023**

*Pioneer Award, 2020 I-Link of XJTLU* **01.2021-04.2021**

*Excellent model, 2020 Military training of XJTLU* **11.2020-12.2020**

## OTHERS

### **Computer Skills & Software:**

- SolidWorks, AutoCAD, 3ds Max, Rhino, SketchBook
- ANSYS (workbench), MATLAB, LTspice, Dr. Frame2D
- Adobe Premiere, Adobe Illustrator, KeyShot, Snagit, Origin
- C language, Arduino

**Language:** Mandarin (Native), English

**Hobbies:**

- Astronomy (The President of XJTLU Sagittarius Astronomy Club and Luoyang NO.1 Senior High School Astronomy Club)
- Robotics (Four designed robotic hand inventions)
- Tea culture (The Vice President of the tea club)
- 3D printing (Familiar with FDM and LCD 3D printers, and the relevant project won the championship of the school competition)