HANG YUAN

111 Ren'ai Road, Suzhou Industrial Park, Suzhou, Jiangsu, China, 215123

Tel.: (+86) 15824969252 • Email: Hang.Yuan20@student.xjtlu.edu.cn

Web: https://enderhangyuan.github.io/

EDUCATION

Xi'an Jiaotong-Liverpool University (XJTLU)   Suzhou, China
Bachelor of Engineering in Mechatronics and Robotics Systems   *Expected: June 2024*
University of Liverpool (UoL)   Liverpool, United Kingdom
Bachelor of Engineering in Mechatronics and Robotics Systems   *Expected: June 2024*
- Weighted Average Mark: 66/100 (British marking criteria)
- GRE General Test: 327 (Verbal: 160; Quantitative: 167) + 4.5 (Analytical Writing)

PUBLICATIONS

Peer-Reviewed Journal Papers:
1. **Yuan, H.**, Yuan, W. *et al*. Microfluidic-Assisted *Caenorhabditis elegans* Sorting: Current Status and Future Prospects. *Cyborg and Bionic Systems, 4,* 0011, Apr. 2023. [Cover paper]
2. Zhang, J.[†], Liu, S.[†], **Yuan, H.**[†] *et al*. Deep Learning for Microfluidic-Assisted *Caenorhabditis elegans* Multi-Parameter Identification Using YOLOv7. *Micromachines, 14,* 1339, Jun. 2023. [†] denotes equal contributions.
3. Yuan, W., **Yuan, H.** *et al*. Facile Microembossing Process for Microchannel Fabrication for Nanocellulose-Paper-Based Microfluidics. *ACS Applied Materials & Interfaces, 15*(5), 6420-6430, Jan. 2023.
4. Yuan, W., **Yuan, H.** *et al*. Microembossing: A Convenient Process for Fabricating Microchannels on Nanocellulose Paper-Based Microfluidics. *Journal of Visualized Experiments, 200*, e65965, Oct. 2023.

Peer-Reviewed Conference Papers:
1. **Yuan H.**, Zhang W. A Novel Hedgehog-Inspired Pin-Array Robot Hand with Multiple Magnetic Pins for Adaptive Grasping. *12th International Conference on Intelligent Robotics and Applications (ICIRA)*, Shenyang, China, Aug. 8-11 2019.

CONFERENCE PARTICIPATION

1. **Yuan H.** *et al*. A Centrifugation-Assisted Lateral Flow Assay Platform for Bioassay Sensitivity and Visualization Enhancement. 4*5th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2023),* Sydney, Australia, Jul. 24-27, 2023. [Poster]
2. Yuan, W., **Yuan H.** *et al*. Highly-integrated SERS-Based Immunoassay NanoPADs for Early Diagnosis of Alzheimer's Disease. 4*5th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2023),* Sydney, Australia, Jul. 24-27, 2023. [Poster]
3. Liu, S., Li, Y., **Yuan, H.** *et al*. A Bio-inspired Lateral Flow Assay for Improving the Sensitivity of Low Volume Samples. *19th International Meeting on Chemical Sensors (IMCS 2023),* Changchun, China, Aug. 4-8, 2023. [Oral]

GRANTED PATENTS

1. **Yuan H.** A Hedgehog-Inspired Magnetic-Driven Self-Adaptive Pin-Array Robot Hand, CN109397278B[P], 2023. [Invention patent]
2. **Yuan H.**, Zhang W. A Cluster-Tube Self-Adaptive Robot Hand with Controllable Force for Rapid Grasping, CN209533441U[P], 2019. [Utility model patent]
3. **Yuan H.** A Hedgehog-Inspired Magnetic-Driven Self-Adaptive Pin-Array Robot Hand, CN209190774U[P], 2019. [Utility model patent]
4. **Yuan H.** A Parallel and Magnetic-Driven Robot Hand with Linkage Mechanisms, CN209453584U[P], 2019. [Utility model patent]

RESEARCH EXPERIENCE

Research Leader, XJTLU   *Supervisor: Dr. Pengfei Song, XJTLU*
Centrifugation-Assisted Lateral Flow Assay (CLFA) Platform   January 2022 - Present
- Developed a CLFA platform with adjustable rotation speeds, enabling smartphone-based quantitative bioassay detection and overcoming limitations of traditional LFA.
- Developed a bio-inspired microfluidic channel to enhance the bioassay sensitivity of LFA.

Research Leader, XJTLU   *Supervisor: Dr. Pengfei Song, XJTLU*
Microfluidic-Assisted *Caenorhabditis elegans* (*C. elegans*) Sorting   July 2022 - June 2023
- Provided a review about *C. elegans* sorting featured by organizations *AAAS & EurekAlert!*.
- Developed a deep learning model using YOLOv7 to automatically detect and recognize *C. elegans* in microfluidic chips, enabling efficient identification and measurement of multiple phenotypes (*e.g.*, size and movement speed).

Research Assistant, XJTLU
Supervisors: Prof. Xinyu Liu, University of Toronto & Dr. Pengfei Song, XJTLU
Nanocellulose-Paper-Based Microfluidic Platform   July 2022 - Present
- Developed a facile microembossing process using plastic micro-molds to efficiently fabricate microchannels on nanocellulose paper (nanopaper).
- Detected untreated glial fibrillary acidic protein (GFAP) in human plasma without pretreatment using SERS on functional nanopaper-based analytical devices (NanoPADs), enabling highly sensitive early screening of Alzheimer's disease.

Visiting Student, Tsinghua University   *Supervisor: Dr. Wenzeng Zhang, Tsinghua University*
Self-Adaptive Robot Hands   January 2018 - August 2019
- Developed a hedgehog-inspired pin-array robot hand with multiple magnetic pins for adaptive grasping, efficiently adjusting to diverse object shapes and sizes.

TEACHING EXPERIENCE

Student lecturer, XJTLU Optional Course   March 2021 - March 2022
- Lectured undergraduate class of about 50 students; demonstrated robot hand techniques.

Student lecturer, XJTLU-Affiliated School   September 2021 - August 2022
- Lectured high school student class of about 50 students; provided extracurricular courses, including robotics, 3D printing, tea culture, and astronomy.

SELECTED HONORS & AWARDS

- Excellent Student Cadre (University-wide top 0.1%), Jiangsu Province, China   2022
- Outstanding Student (School-wide top 5%), XJTLU   2022
- Two 1st Prizes of 2022 RoboMaster University Championship in the 21st National University Robot Competition *National Achievement & Robot Combat Award*   2022-2023
- The 1st Prize of RoboWork China Engineering Robotics Competition   2021-2022

SKILLS

Computer Skills & Software:
- *Programming*: C, Arduino, MATLAB
- *CAD/CAE*: SolidWorks, AutoCAD, ANSYS (workbench), Rhino
- *Graphic design*: Adobe Illustrator, Adobe Premiere, Adobe Photoshop, KeyShot, Origin

Experimental Skills:
- *Fabrication*: 3D printing, wax printing, laser cutting
- *Immunoassays*: Enzyme-linked immunosorbent assay (ELISA), Lateral flow assay (LFA)
- *Chemical synthesis*: AuNPs, AgNPs, Bottlebrush elastomers
- *Characterization*: UV-vis, FTIR, SEM, SERS, XRD

Language: Mandarin (Native), English (English-only instruction)

REFERENCES

Pengfei Song, Ph. D., Assistant Professor   Pengfei.Song@xjtlu.edu.cn
Department of Mechatronics and Robotics, Xi'an Jiaotong-Liverpool University
111 Ren'ai Road, Suzhou, Jiangsu, China 215123   0086-512-81889039

Min Chen, Ph. D., Senior Associate Professor   Min.Chen@xjtlu.edu.cn
Department of Mechatronics and Robotics, Xi'an Jiaotong-Liverpool University
111 Ren'ai Road, Suzhou, Jiangsu, China 215123   0086-512-81880471

Xinyu Liu, Ph.D., Professor   xyliu@mie.utoronto.ca
Department of Mechanical & Industrial Engineering, University of Toronto
5 King's College Road, Toronto, Ontario, Canada M5S 3G8   001-416-978-3040

Wenzeng Zhang, Ph.D., Associate Professor   wenzeng@tsinghua.edu.cn
Department of Mechanical Engineering, Tsinghua University
Wudaokou, Beijing, China 100084