HANG YUAN

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EDUCATION

Michigan State University (MSU) East Lansing, U.S.A.
Ph.D. student in Biomedical Engineering *From: Aug. 2024*
Xi'an Jiaotong-Liverpool University (XJTLU) Suzhou, China
B.Eng. in Mechatronics and Robotic Systems (First Class (Honours)) *Sep. 2020 - Jun. 2024*
University of Liverpool (UoL) Liverpool, United Kingdom
B.Eng. in Mechatronics and Robotic Systems (First Class (Honours)) *Sep. 2020 - Jun. 2024*

PUBLICATIONS

Peer-Reviewed Journal Papers:

1. H. Yuan†, R. Yong†, W. Yuan† *et al.*, Centrifugation-assisted lateral flow assay platform: enhancing bioassay sensitivity with active flow control. *Microsystems & Nanoengineering*, *11*, 101, May 2025. [Feature article] † denotes equal contributions.
2. H. Yuan, W. Yuan *et al.*, Microfluidic-Assisted *Caenorhabditis elegans* Sorting: Current Status and Future Prospects. *Cyborg and Bionic Systems*, *4*, 0011, Apr. 2023. [Cover paper]
3. H. Yuan, W. Yuan *et al.*, Navigating the uncertainty: the impact of a student-centered final year project allocation mechanism on student performance. *Humanities and Social Sciences Communications*, *11*, 776, Jun. 2024.
4. J. Zhang†, S. Liu†, H. Yuan† *et al.*, Deep Learning for Microfluidic-Assisted *Caenorhabditis elegans* Multi-Parameter Identification Using YOLOv7. *Micromachines*, *14*, 1339, Jun. 2023.
5. W. Yuan, H. Yuan *et al.*, A SERS nanocellulose-paper-based analytical device for ultrasensitive detection of Alzheimer's disease. *Analytica Chimica Acta*, *1301*, 342447, May 2024.
6. W. Yuan, H. Yuan *et al.*, Facile Microembossing Process for Microchannel Fabrication for Nanocellulose-Paper-Based Microfluidics. *ACS Applied Materials & Interfaces*, *15*(5), 6420-6430, Jan. 2023.
7. W. Yuan, H. Yuan *et al.*, Microembossing: A Convenient Process for Fabricating Microchannels on Nanocellulose Paper-Based Microfluidics. *Journal of Visualized Experiments*, *200*, e65965, Oct. 2023.
8. J. Zhu, H. Yuan *et al.*, The Impact of Short Videos on Student Performance in an Online-Flipped College Engineering Course. *Humanities and Social Sciences Communications*, *9*, 327, Sep. 2022.
9. W. Yuan†, K. Jiao†, H. Yuan *et al.*, MOFs/Heterojunction Structures for Surface-enhanced Raman Scattering with Enhanced Sensitivity and Tailorability. *ACS Applied Materials & Interfaces*, *16*(20), 26374-26385, Apr. 2024. [Cover Paper]
10. M. Lu†, W. Yuan†, R. Yong, H. Yuan *et al.*, Facile Laser Cutting Process for Nanocellulose-Paper-Based Microfluidic Microchannel Fabrication. *IEEE Sensors Journal*, *25*, 4,

2025.

11. P. Song, P. Ou, Y. Wang, H. Yuan *et al*., An Ultrasensitive FET Biosensor Based on Vertically Aligned MoS_2 Nanolayers with Abundant Surface Active Sites. *Analytica Chimica Acta*, *1252*, 341036, Apr. 2023.
12. L. Wang, L. He, F. Liu, H. Yuan *et al*., Mechanical Characterization of Multifunctional Metal-Coated Polymer Lattice Structures. *Materials*, *17*(3), 741, Feb. 2024.
13. K. Jiao, W. Cao, W. Yuan, H. Yuan *et al*., Cellulose Nanostructures as Tunable Substrates for Nanocellulose-Metal Hybrid Flexible Composites. *ChemPlusChem*, *2024*, e202300704, Feb. 2024.
14. W. Yuan, K. Jiao, R. Yong, H. Yuan *et al*., MOF-Assisted Nanocellulose Paper-Based Platform for Multiple Surface-Enhanced Raman Scattering Detection, *Analytical Chemistry*, *97*, 35, Aug. 2025. [Cover paper]
15. S. Duan, T. Cai, F. Liu, Y. Li, H. Yuan *et al*., Automatic offline-capable smartphone paper-based microfluidic device for efficient biomarker detection of Alzheimer's disease. *Analytica Chimica Acta*, *1308*, 342575, Apr. 2024.

Peer-Reviewed Conference Papers:

1. H. Yuan, W. Zhang, A Novel Hedgehog-Inspired Pin-Array Robot Hand with Multiple Magnetic Pins for Adaptive Grasping. *12th International Conference on Intelligent Robotics and Applications (ICIRA)*, *5*(12), 684-695, Shenyang, China, Aug. 8-11, 2019.
2. W. Yuan, H. Yuan *et al*., Transfer Printing Assisted Fabrication of a Cicada Wing Inspired Nanopaper SERS Platform. *2025 International Conference on Advanced Mechatronic Systems (ICAMechS)*, 220-225, Xian, China, Sep.19-22, 2025.
3. S. Duan, R. Yong, H. Yuan *et al*., Automated Offline Smartphone-Assisted Microfluidic Paper-Based Analytical Device for Biomarker Detection of Alzheimer's Disease. *46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'24)*, Orlando, U.S.A., Jul. 15-19, 2024.
4. J. Sun, S. Duan, R. Yong, H. Yuan *et al*., An Automated Microfluidic Paper-Based Analytical Device for Chemiluminescence Immunoassay. *EMBC'24*, Orlando, U.S.A., Jul. 15-19, 2024.
5. L. Wang, Z. Zhang, M. Chen, J. Xie, F. Liu, H. Yuan *et al.*, Machine Learning-Based Fatigue Life Evaluation of the Pump Spindle Assembly with Parametrized Geometry. *ASME 2023 International Mechanical Engineering Congress & Exposition (IMECE)*, *87684*, V011T12A022, New Orleans, USA, Oct. 29-Nov. 2, 2023.

CONFERENCE PARTICIPATION

1. H. Yuan†, R. Yong† *et al*., A Centrifugation-Assisted Lateral Flow Assay Platform for Bioassay Sensitivity and Visualization Enhancement. *EMBC'23*, Sydney, Australia, Jul. 24-27, 2023. [Poster] † denotes equal contributions.
2. W. Yuan, H. Yuan *et al*., Highly-integrated SERS-Based Immunoassay NanoPADs for Early Diagnosis of Alzheimer's Disease. *EMBC'23*, Sydney, Australia, Jul. 24-27, 2023. [Poster]
3. R. Yong†, W. Yuan†, H. Yuan *et al*. Nanocellulose-Paper-Based Analytical Devices with MOFs/Heterojunction Structures for Multiplex SERS Detection. *EMBC'24*, Orlando, U.S.A., Jul. 15-19, 2024. [Poster]
4. S. Liu, Y. Li, H. Yuan *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]

5. S. Duan, T. Cai, F. Liu, H. Yuan *et al*., An Offline Deep Learning-Assisted Automated Paper-Based Microfluidic Platform. *27th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS 2023)*, Katowice, Poland, Oct. 15-19, 2023. [Poster]

GRANTED PATENTS

1. H. Yuan, W. Zhang, A Cluster-Tube Self-Adaptive Robot Hand with Controllable Force for Rapid Grasping, CN109571539B[P], 2023. [Invention patent]
2. H. Yuan, A Parallel and Magnetic-Driven Robot Hand with Linkage Mechanisms, CN109531610B[P], 2023. [Invention patent]
3. H. Yuan, A Hedgehog-Inspired Magnetic-Driven Self-Adaptive Pin-Array Robot Hand, CN109397278B[P], 2023. [Invention patent]
4. P. Song, S. Duan, E.G. Lim, T. Cai, H. Yuan, C. Zhao, A Smartphone-Based Automated Paper-Based Microfluidic System, CN116338159B[P], 2024. [Invention patent]
5. H. Yuan, W. Zhang, A Cluster-Tube Self-Adaptive Robot Hand with Controllable Force for Rapid Grasping, CN209533441U[P], 2019. [Utility model patent]
6. H. Yuan, A Hedgehog-Inspired Magnetic-Driven Self-Adaptive Pin-Array Robot Hand, CN209190774U[P], 2019. [Utility model patent]
7. H. Yuan, A Parallel and Magnetic-Driven Robot Hand with Linkage Mechanisms, CN209453584U[P], 2019. [Utility model patent]

RESEARCH EXPERIENCES

Graduate Research Assistant, MSU — *Supervisor: Dr. Jinxing Li, MSU*
Living materials — Aug. 2024 - Present

Undergraduate Research Assistant, XJTLU — *Supervisor: Dr. Pengfei Song, XJTLU*
Paper-based microfluidics for biomarker detection — Jul. 2022 - Jun. 2024

Mechanical Engineer & Investment Manager, XJTLU
Supervisors: Prof. Cezhou Zhao, XJTLU & Dr. Chun Zhao, XJTLU
Competitive Combat Robots — Oct. 2020 - Oct. 2022

Visiting Student, Tsinghua University — *Supervisor: Dr. Wenzeng Zhang, Tsinghua University*
Self-Adaptive Robot Hands — Jan. 2018 - Aug. 2019

TEACHING EXPERIENCES

Student lecturer, XJTLU Optional Course — Mar. 2021 - Mar. 2022
Student lecturer, XJTLU-Affiliated School — Sep. 2021 - Aug. 2022

SKILLS

Computer Skills & Software:

- *Programming*: C, Arduino, MATLAB
- *CAD/CAE*: SolidWorks, Blender, AutoCAD, ANSYS (workbench)
- *Graphic design*: Adobe Illustrator, Adobe Premiere Pro, Adobe Photoshop, KeyShot, Origin

Experimental Skills:

- *Fabrication*: 3D printing, Wax printing, Laser cutting
- *Immunoassays*: Enzyme-linked immunosorbent assay (ELISA), Lateral flow assay (LFA)

- *Microbiology*: Fungal and bacterial cultures
- *Chemical synthesis*: AuNPs, AgNPs, Liquid crystal elastomers
- *Characterization*: UV-vis, FTIR, SEM, EDX, SERS, XRD, Confocal microscope

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

SELECTED HONORS & AWARDS

- The IET Prize, The Institution of Engineering and Technology 2024
- Excellent Undergraduate Final Year Project Award, Jiangsu Province, China 2024
- Best Performance in Final Year Project (School-wide top 1), XJTLU 2024
- Final Year Project Best Student Poster (School-wide top 1), XJTLU 2024
- Outstanding Student (University-wide top 0.1%), Jiangsu Province, China 2024
- Excellent Student Cadre (University-wide top 0.1%), Jiangsu Province, China 2022

SERVICE & ACTIVITIES

- Executive Director, Yuanhe Technology (Changzhou) *Co., Ltd.* 2022-2025
- President, XJTLU Sagittarius Astronomy Club 2021-2022