李龙龙

个人简历 | 全南国立大学 机械工程系 博士研究生

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研究方向：MEMS、微纳传感器、3D 生物电子传感平台，以及工程化心脏组织的多模态机电分析。

教育经历

- 2022-至今 | 全南国立大学，机械工程博士，韩国 光州
- 2018-2022 | 温州大学，机械工程本科，中国 温州

科研经历

- 开展面向工程化心肌组织的 MEMS 与柔性多模态传感器研究。
- 构建 3D 生物电子平台，用于组织成熟化、药物心脏毒性筛选与体外心脏疾病模型研究。
- 整合应变、电学与结构读出，实现对心脏组织电机械行为的实时表征。

研究兴趣

- BioMEMS 传感平台
- 工程化心脏组织监测
- 多模态机电记录
- 药物心脏毒性评估

项目经历

- 2026.03-至今 | 仿生心脏缺氧模型与机电评估平台，MNTL
- 2024.03-2026.03 | 基于3D心脏组织的高通量药物毒理筛选平台，MNTL
- 2022.09-2024.03 | 石墨烯导电微环境对心肌细胞电生理通讯与成熟的调控机制，MNTL
- 2022.01-2022.08 | 智能垃圾桶的开发，慈溪卓尚电器有限公司
- 2021.01-2021.12 | 桌面级定制食品3D打印机，温州大学
- 2020.01-2020.12 | 基于视觉识别与导航的玩具收纳机器人，温州大学

论文发表

- 2024 | Graphene SU-8 platform for enhanced cardiomyocyte maturation and intercellular communication in cardiac drug screening. ACS Nano 18(49): 33293-33309.
- 2025 | Harnessing native blueprints for designing bioinks to bioprint functional cardiac tissue. iScience 28(3).
- 2025 | Development of multifunctional PAA-alginate-carboxymethyl cellulose hydrogel-loaded fiber-reinforced biomimetic scaffolds for controlled release of curcumin. International Journal of Biological Macromolecules 301: 140449.
- 2025 | Dual-sensitized hollow SnO2 nanospheres with rGO and Pd for highly sensitive detection of acetone in exhaled breath. Applied Surface Science 696: 162959.
- 2025 | Hydrogel-Integrated Biomimetic Hydroxyapatite Scaffolds with Tunable Porosity for Enhanced Curcumin Delivery. Journal of Drug Delivery Science and Technology, 107572.
- 2025 | Enhancing cardiomyocyte maturation through PEDOT:PSS-coated surfaces and mechanical stimulation with strain sensors. Journal of Micromechanics and Microengineering 35(4): 045002.

- 2025 | InGaN-GaN-MQW-ZnO based e-nose sensors for nitrogen dioxide detection using advanced machine learning approaches. Sensors and Actuators B: Chemical, 138650.
- 2026 | Air-Breakdown Triboelectric Nanogenerator Inspired by Transistor Architecture for Low-Force Human-Machine Interfaces. Nano-Micro Letters 18(1): 251.
- 2026 | Tilted-angle acoustofluidic separation of live and dead neonatal rat ventricular myocytes using hypotonic cell swelling. Sensors and Actuators B: Chemical.

学术会议

- 2023 | The hybrid cantilever of conductive graphene and su-8 for improving the maturity and electrical coupling of cardiomyocytes. MicroTAS 2023, Katowice, Poland.
- 2024 | Enhancing Cardiomyocyte Maturation via Mechanical Stimulation of 3D Printed Cardiac Tissue Using a Origami-based 3D Sensor and Magnetic Fields. IEEE NANOMED 2024, Hawaii, USA.
- 2024 | Polymer Cantilever Integrated with a Full-Bridge Sensor for Continuous Wireless Measurement of Cardiomyocyte Contractility. MicroTAS 2024, Montreal, Canada.
- 2024 | MONITORING OF DRUG-IMFACTED CARDIOMYOCYTES CONTRACTILITY USING PI MICROCANTILEVER STRUCTURES WITH NANO-SILICON STRAIN SENSOR. MicroTAS 2024, Montreal, Canada.
- 2025 | A Dual-Detection Approach for Cardiotoxicity Screening: Utilizing Nano Silicon Strain Sensor and Mea to Monitor Contractility and Field Potential in Cardiomyocytes. IEEE MEMS 2025, Kaohsiung, Taiwan.
- 2025 | Origami-Inspired 3D Sensor Platform for Real-Time Electromechanical Coupling Analysis in Engineered Heart Tissues. IEEE SENSORS 2025, Vancouver, Canada.
- 2025 | Integrated Bioelectronic Platform Utilizing PEDOT:PSS Strain Sensors for Real-Time Mechanostimulation and Sensing. IEEE SENSORS 2025, Vancouver, Canada.
- 2025 | Development of a Multi-Channel Wireless Monitoring Platform for Long-Term Cardiomyocyte Contraction Assessment Using a Polymer Cantilever with integrated Sensor. MicroTAS 2025, Adelaide, Australia.
- 2025 | Enhancement of cardiomyocyte microenvironment and functional assessment using through-hole structures with integrated polymer cantilevers. MicroTAS 2025, Adelaide, Australia.
- 2026 | Multimodal Microelectrode-Microcantilever Array for Electromechanical Analysis of Cardiomyocyte Tissue in Drug Testing. IEEE MEMS 2026, Salzburg, Austria.

专利

- 一种无人机集群的智能收发管理装置，CN216269980U。
- 一种自动马铃薯收获机，CN216415123U。
- 马铃薯挖掘装置，CN216313996U。
- 一种脚点穴位自动滚压刺激装置，CN214278088U。
- 厨余垃圾收集车，CN113369827A / CN113369827B。
- 开沟起垄一体机，CN112023495A / CN112023495B。
- 一种基于纵向折叠的衣服折叠机，CN113186699A / CN113186699B。

奖励荣誉

- 2025 | BK21 Fellowship Scholarship
- 2025 | RLRC Outstanding Graduate Student
- 2021 | 中国国家奖学金

- 2019 | 浙江省政府奖学金

技术技能

- 微纳制造与器件开发：熟练掌握 MEMS 与柔性传感器件的微纳加工工艺及传感器性能表征。
- 组织工程与细胞培养：熟练进行 NRVM / hiPSC-CMs 心肌细胞培养，精通 3D 工程心脏组织（EHT）的构建与生物墨水（胶原 / dECM）体系调配。
- 测试系统与硬件搭建：具备实验原型机开发能力，能独立搭建集成闭环控制、应变传感器和微电极阵列（MEA）检测的同步测量系统。
- 多模态信号处理：熟练使用 Python / MATLAB 处理并分析心脏机电多模态信号，提取关键机电生理特征。