

# Xin Li

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## BIBLIOGRAPHY

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**Xin** is now an **Associate Professor** with the Guangzhou Institute of Technology, **Xidian University**, China. He received the Ph.D. degree from a joint program of the Shanghai Institute of Microsystem and Information Technology, **Chinese Academy of Sciences**, and **Nanyang Technological University**, Singapore. His research supervisors were **Prof. Junrui Liang** and **Prof. Yaowen Yang**.

With the vision of building an Internet of Moving Things free from batteries, less polluting, and sustainable, his research focuses on designing effective, reliable, and scalable battery-free IoT solutions based on kinetic energy harvesting. His research interests include **energy harvesting**, **intermittent computing**, **ubiquitous computing**, and **battery-free IoT system**.

## EDUCATIONS

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<b>Nanyang Technological University</b> <i>Ph.D. (Joint Training) in Information and Communication Engineering</i> <i>Research supervisor: Prof. Yaowen Yang</i>	Singapore Sept. 2021 – Jul. 2022
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<b>University of Chinese Academy of Sciences</b> <i>Ph.D. in Information and Communication Engineering</i> <i>Research supervisor: Prof. Junrui Liang</i>	Shanghai, China Sept. 2018 – Jun. 2022
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<b>University of Chinese Academy of Sciences</b> <i>M.Sc in Information and Communication Engineering</i> <i>Research supervisors: Prof. Jianming Wei and Dr. Xiaoyuan Ma</i>	Shanghai, China Sept. 2017 – Jun. 2018
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## RESEARCH HONORS

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- **Best Paper** of the International Conference on Vibration and Energy Harvesting Applications (VEH) in 2021.
- **Best Student Hardware Competition Finalist** of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) in 2020.
- **1st Runner Up** of the IEEE Industrial Electronics Society (IES) Inter-Chapter Paper Competition in 2019.
- **1st Place** at the ACM/IEEE International Conference on Embedded Wireless Systems and Networks (EWSN) Dependability Competition – Category “Data Collection” in 2019.
- **3rd Place** at the ACM/IEEE International Conference on Embedded Wireless Systems and Networks (EWSN) Dependability Competition in 2018.

## RESEARCH PROJECTS

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<b>KPID: a kinetic-powered IDentification system</b> <i>Xidian University</i> <ul style="list-style-type: none"><li>• Battery-free BLE mesh system.</li></ul>	Jan. 2021 – Present Guangzhou, China
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<b>ViPSN and ViPSN++: a vibration-powered IoT platform</b> <i>Xidian University</i> <ul style="list-style-type: none"><li>• ViPSN: an open-source development platform specified for vibration-powered IoT devices.</li><li>• ViPSN-cam: a vibration-powered ubiquitous camera.</li><li>• ViPSN-gameboy: a transient-motion-powered gameboy.</li><li>• ViPSN-pluck: a transient-motion-powered motion detector.</li><li>• 1st Runner Up of the IEEE Industrial Electronics Society (IES) Inter-Chapter Paper Competition in 2019.</li><li>• Best Student Hardware Competition Finalist of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) in 2020.</li></ul>	Jan. 2019 – Jan. 2020 Guangzhou, China
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- Best Paper of the 3rd International Conference on Vibration and Energy Harvesting Applications (VEH) in 2021.

## Energy Informatization for Sustainable ICT

*Tsinghua University and ShanghaiTech University*

Dec. 2021 – Present

*Shanghai, China*

- Network resource allocation based on the fusion of energy flow and information flow under the condition of energy uncertainty.

## DeCot and DeCot++: dependable MAC protocols for IEEE 802.15.4

*Shanghai Advanced Research Institute, Chinese Academy of Sciences*

Mar. 2017 – Jan. 2019

*Shanghai, China*

- Proposed a dependable concurrent transmission-based WSN to stand against interference.
- D-Cube: a large-scale wireless sensor network testbed.
- MoteScatter: a noise-modulation-based backscatter communication under harsh interference.
- 3rd place at the EWSN Dependability Competition in 2018.
- 1st place at the EWSN Dependability Competition – Category “Data Collection” in 2019.

## PUBLICATIONS

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### Journal Papers (\* corresponding author, + co-first author, underline: supervised students)

1. **Xin Li**, Guobiao Hu, Yaowen Yang\*, and Junrui Liang\* “Dynamic Analysis of A Plucking Energy Harvester for Transient-motion-powered IoT Applications,” IEEE/ASME Transactions on Mechatronics, under review. (**VEH 2021 Best Paper**)
2. Shiyi Liu, **Xin Li**, Li Teng, Guobiao Hu, and Junrui Liang\*, “Energy and dynamic analysis of quasi-static toggling mechanical energy harvester,” Nano Energy, 2022.
3. Qiang Liu, **Xin Li**+, Hao Zhang, Jing Ren\*, Shuo Yang, Leitao Cao, Junrui Liang\*, Shengjie Ling\*, “IntelliSense silk fibroin ionotronic batteries for wildfire detection and alarm,” Nano Energy, 2022.
4. **Xin Li**, Guobiao Hu, Zhenkun Guo, Junlei Wang, Yaowen Yang\*, and Junrui Liang\*, “Frequency Up-conversion based Vibration Energy Harvesting Technology: A Review (invited paper),” Symmetry, 2022.
5. Jianjun Wang\*, Yalei Cao, Hongjun Xiang, Zhiwei Zhang, Junrui Liang, **Xin Li**, Deyun Ding, Teng Li, Lihua Tang, “A Piezoelectric Smart Backing Ring for High-performance Power Generation Subject to Train Induced Steel-spring Fulcrum Forces,” Energy Conversion and Management, 2022.
6. **Xin Li**, Hong Tang, Guobiao Hu, Bao Zhao, and Junrui Liang\*, “ViPSN-pluck: A Transient-motion-powered Motion Detector,” IEEE Internet of Things Journal, 2021.
7. **Xin Li**, Li Teng, Hong Tang, Haoyu Wang, Yu Liu, Minfan Fu, and Junrui Liang\*, “ViPSN: A Vibration-powered IoT Platform,” IEEE Internet of Things Journal, 2021.
8. Junrui Liang\*, **Xin Li**, and Hailiang Yang, “Kinetic Energy Harvesting toward Battery-free IoT: Opportunities and Challenges (invited paper),” ZTE Communications, 2021.
9. Guobiao Hu, Chaoyang Zhao, Yaowen Yang\*, **Xin Li**, and Junrui Liang\*, “Triboelectric Energy Harvesting Using An Origami-inspired Structure,” Applied Energy, 2021.
10. Zhenkun Guo, Guobiao Hu, Jingchao Jiang, Liuding Yu, **Xin Li**, and Junrui Liang\*, “Theoretical and Experimental Study of The Vibration Dynamics of A 3D-printed Sandwich Beam with Hourglass Lattice Truss Core (invited paper),” Frontiers in Mechanical Engineering, 2021.
11. Jinxi Zhang, Shaobo Gong, **Xin Li**, Junrui Liang, Zhonglin Wang\*, and Kailiang Ren\*, “A Wind-driven Poly (tetrafluoroethylene) Electret and Polylactide Polymer-based Hybrid Nanogenerator for Self-powered Temperature Detection System,” Advanced Sustainable Systems, 2020.
12. Xiaoyuan Ma\*, Peilin Zhang, **Xin Li**, Weisheng Tang, Jianming Wei\*, and Oliver Theel, “DeCoT: A Dependable Concurrent Transmission-based Protocol for Wireless Sensor Network,” IEEE Access, 2018.

### Conference Papers (\* corresponding author, + co-first author, underline: supervised students)

1. Yue Zhu, **Xin Li\***, and Junrui Liang, "Live Demo of Motion-powered Gameboy," Proceedings of the 7th International Workshop on Real-World Embedded Wireless Systems and Networks, in conjunction with the 20th ACM Conference on Embedded Networked Sensor Systems, Boston, United States, 2022. (Sensys 2022)
2. **Xin Li**, "Opportunities of Motion-powered IoT Systems," Proceedings of the 2021 International Conference on Embedded Wireless Systems and Networks, Delft, Netherlands, 2021. (EWSN 2021)
3. **Xin Li**, Hong Tang, Guobiao Hu, and Junrui Liang\*, "Live Demo of A Transient-motion-powered Human Motion Detector," Proceedings of the 2021 IEEE International Symposium on Circuits and Systems, Daegu, Korea, 2021. (ISCAS 2021)
4. **Xin Li**, Hong Tang, Bao Zhao, and Junrui Liang\*, "System Design and Implementation of A Transient-motion-powered IoT Sensor Node," Proceedings of the ASME 2020 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Irvine, CA, USA, 2020. (SMASIS 2020) (**Finalist of Best Student Hardware Competition**)
5. **Xin Li**, Hong Tang, Yiyao Zhu, and Junrui Liang\*, "Power Solution of A Vibration-powered Sensing Node," Proceedings of the 9th International Power Electronics and Motion Control Conference, Nanjing, China, 2020. (ECCE Asia 2020)
6. **Xin Li**, Hong Tang, Junrui Liang\*, and Lihua Tang, "Exploring The Magnetic Plucking Motion towards A Transient-motion-powered IoT Sensor Node," Proceedings of SPIE Conference, Active and Passive Smart Structures and Integrated Systems IX, 2020. (SPIE SS/NDE 2020)
7. Xiaoyuan Ma, Peilin Zhang, Ye Liu, **Xin Li**, Weisheng Tang, Pei Tian, Jianming Wei, Lei Shu, and Oliver Theel, "Competition: Using DeCot+ to Collect Data under Interference," Proceedings of the 2019 International Conference on Embedded Wireless Systems and Networks, Beijing, China, 2019. (EWSN 2019) (**1st place of Dependability Competition**)
8. **Xin Li**, Xiaoyuan Ma\*, Peilin Zhang, Pei Tian, and Jianming Wei\*, "Escape or Exploit? A Noise-modulation-based Communication under Harsh Interference," Proceedings of the 7th International Workshop on Real-World Embedded Wireless Systems and Networks, in conjunction with the 16th ACM Conference on Embedded Networked Sensor Systems, Shenzhen, China, 2018. (SenSys 2018)
9. Xiaoyuan Ma\*, Peilin Zhang, Weisheng Tang, **Xin Li**, Wangji He, Fuping Zhang, Jianming Wei\*, and Oliver Theel, "Using Enhanced OFDCOIN to Monitor Multiple Concurrent Events under Adverse Conditions," Proceedings of the 2018 International Conference on Embedded Wireless Systems and Networks, Madrid, Spain, 2018. (EWSN 2018) (**3rd place of Dependability Competition**)