Yulong Liu

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Research Interests

Electronic textiles, flexible tactile sensing, robotic electronic skin, wearable electronics, RFID, antenna design, edge signal processing, and intelligent sensing systems.

Education

Aug 2021 -- Aug 2026 **The Hong Kong Polytechnic University** (Hong Kong, China)

Ph.D. in Applied Physics

Aug 2015 -- Jul 2019 **Southern University of Science and Technology** (Shenzhen, China)

B.Eng. in Communication Engineering

Work Experience

Aug 2026 -- Present **The Chinese University of Hong Kong, Shenzhen** (Shenzhen, China)

Postdoctoral Fellow

- Conducted research on electronic textiles, flexible tactile sensing, and robotic electronic skin for whole-body robotic tactile perception and human–robot interaction, covering fabric sensing materials and structures, flexible sensing arrays, conductive interconnects, signal acquisition, and intelligent sensing systems.
- Developed large-area flexible tactile sensors and electronic skins using knitting and embroidery processes to capture pressure, contact, and deformation, and combined edge signal processing with machine learning for tactile recognition and robotic application validation.

Aug 2026 -- Present **Jiaxing Research Institute of Southern University of Science and Technology** (Jiaxing, China)

Head of E-Textile R&D

- Led R&D of electronic-textile sensors, robotic tactile skins, flexible sensing arrays, and accompanying acquisition systems, covering the full pipeline from material and device design, textile manufacturing, and sensor characterization to hardware interfaces, data acquisition, edge processing, and system integration.
- Drove engineering applications of electronic textiles in whole-body robotic tactile sensing, wearable perception, and intelligent interaction, including technical planning, R&D coordination, and prototype iteration.

Jul 2019 -- Aug 2021 **Southern University of Science and Technology** (Shenzhen, China)

Research Assistant

- Designed and fabricated embroidered electronic devices based on conductive yarns for wearable applications, including sensors, transmission lines, antennas, and related devices.
- Combined RFID technology with existing sensors to enable wireless, battery-free sensing in the on-body area.

Jun 2018 -- Dec 2018 | **Laxcen Technology Limited** (Shenzhen, China)

Intern Engineer

- Modeled near-field ultra-high-frequency (UHF) RFID reader antennas using HFSS. The antenna (called the "Zero-Phase-Shift Loop", or ZPSL antenna) overcomes undesired read-range issues and enlarges the interrogation zone.
- Designed and fabricated various UHF RFID tag antennas and tested their performance in real environments, showing good commercialization potential.

Professional Service

- Reviewer, IEEE Journal of Radio Frequency Identification, 2019 – Present
- Reviewer, IEEE Transactions on Antennas and Propagation (TAP), 2021 – Present
- Reviewer, IEEE Sensors Journal, 2021 – Present
- Reviewer, IEEE Internet of Things Journal, 2021 – Present
- Publicity Minister, Residential College Student Union, 2016 – 2017

Awards and Honors

IEEE RFID Conference 2026 Best Paper Finalist, IEEE 2026

University Scholarship, Southern University of Science and Technology 2018

National Endeavor Scholarship, Ministry of Education of the PRC 2017

Shude College Scholarship, Southern University of Science and Technology 2017

Freshman Scholarship, Southern University of Science and Technology 2015

Publications

Journal Articles

1. **A Lightweight and Low-Latency Framework for Tactile Texture Recognition at Edge Using Linear Predictive Coding (LPC)**
   Rusong Yang, Ruiqi Zhang, **Yulong Liu**, Lulu Xu, and Terry Tao Ye*
   IEEE Access, vol. 14, pp. 39841–39851, 2026.
2. **Parasitic Capacitance Modeling and Measurements of Conductive Yarns for e-Textile Devices**
   Ziqi Qu†, Zhechen Zhu†, **Yulong Liu**†, Mengxia Yu, and Terry Tao Ye*
   Nature Communications, vol. 14, no. 1, art. no. 2785, 2023.
3. **An All-Fabric Tactile-Sensing Keypad with Uni-Modal and Ultrafast Response/Recovery Time for Smart Clothing Applications**
   Mingxun Chen†, Lulu Xu†, **Yulong Liu**†, Mengxia Yu†, Yi Li, and Terry Tao Ye*
   ACS Applied Materials & Interfaces, vol. 14, no. 21, pp. 24946–24954, May 2022.
4. **Battery-Less Sensing of Body Movements Through Differential Backscattered RFID Signals**
   Tingzhe Wang, Siqi Dai, **Yulong Liu**, and Terry Tao Ye*
   IEEE Sensors Journal, vol. 22, no. 9, pp. 6490–6498, May 2022.
5. **E-Textile Battery-Less Displacement and Strain Sensor for Human Activities Tracking**
   Yulong Liu†, Mengxia Yu†, Bingyi Xia, Silong Wang, Miao Wang, Mingxun Chen, Siqi Dai, Tingzhe Wang, and Terry Tao Ye*
   IEEE Internet of Things Journal, vol. 8, no. 22, pp. 16486–16497, Nov. 2021.
6. **"Unconventionally Shaped" Antenna Design for UHF RFID Tags**
   Silong Wang, **Yulong Liu**, and Terry Tao Ye*
   International Journal of Antennas and Propagation, vol. 2021, art. no. 9965252, 2021.
7. **Coolmax/Graphene-Oxide Functionalized Textile Humidity Sensor with Ultrafast Response for Human Activities Monitoring**
   Lulu Xu†, Heng Zhai†, Xiao Chen, **Yulong Liu**, Miao Wang, Zhangchi Liu, Muhammad Umar, Chengyu Ji, Zhongda Chen, Lu Jin,

Zekun Liu, Qingwen Song, Pengfei Yue, Yi Li*, and Terry Tao Ye*
Chemical Engineering Journal, vol. 412, art. no. 128639, May 2021.

8. **Exploiting Embroidered UHF RFID Antennas as Deformation Sensors**
Mengxia Yu, Xuanyu Shang, Miao Wang, **Yulong Liu**, and Terry Tao Ye*
IEEE Journal of Radio Frequency Identification, vol. 4, no. 4, pp. 406–413, Dec. 2020.

9. **Characterizations and Optimization Techniques of Embroidered RFID Antenna for Wearable Applications**
Yulong Liu, Mengxia Yu, Lulu Xu, Yi Li, and Terry Tao Ye*
IEEE Journal of Radio Frequency Identification, vol. 4, no. 1, pp. 38–45, Mar. 2020.

Conference Papers

1. **SensYarn: Braiding RFID Sensors in Yarns**
Lulu Xu, Zhengzheng Li, Rusong Yang, Fangli Chen, **Yulong Liu**, and Terry Tao Ye*
2025 IEEE International Conference on RFID Technology and Applications (RFID-TA), Valence, France, Oct. 2025, pp. 1–4.

2. **ID-Yarn: Form-factoring an RFID Tag into a Yarn and How It Can Work Well**
Tianyang Chen, **Yulong Liu**, Zhengzheng Li, Yuchen Jiang, Mengxia Yu, Lulu Xu, and Terry Tao Ye*
2024 IEEE International Conference on RFID Technology and Applications (RFID-TA), Daytona Beach, FL, USA, Dec. 2024, pp. 1–4.

3. **Wearable Deformation Sensor with Ambient Interference Rejection Using Differential Backscattered RFID Signals**
Siqi Dai†, Tingzhe Wang†, **Yulong Liu***, and Terry Tao Ye*
2021 IEEE International Conference on RFID (RFID), Atlanta, GA, USA, 2021, pp. 1–6.

4. **Coupled Planar Coil (CPC) Antenna as a Displacement Sensor for NFC or HF RFID Tags**
Yulong Liu and Terry Tao Ye*
2020 IEEE International Conference on RFID (RFID), Orlando, FL, USA, 2020, pp. 1–6.

5. **Textile Based Embroidery-Friendly RFID Antenna Design Techniques**
Yulong Liu, Lulu Xu, Yi Li, and Terry Tao Ye*
2019 IEEE International Conference on RFID (RFID), Phoenix, AZ, USA, 2019, pp. 1–6.

6. **Deformation Sensitivity Study of Embroidered UHF RFID Antennas**
Mengxia Yu†, Xuanyu Shang†, Miao Wang, **Yulong Liu**, and Terry Tao Ye*
2019 IEEE International Conference on RFID Technology and Applications (RFID-TA), Pisa, Italy, 2019, pp. 322–326.

7. **Passive Embroidered Stretch Sensor Utilizing UHF RFID Antennas**
Mengxia Yu, Silong Wang, **Yulong Liu**, Lulu Xu, and Terry Tao Ye*
2019 IEEE SmartWorld, Ubiquitous Intelligence & Computing (UIC), Leicester, UK, Aug. 2019.

8. **Design and Fabrication of Embroidered RFID Antennas for Wearable Applications**
Lulu Xu, **Yulong Liu**, Yi Li, Pui Yi Lau, Haitao Si, and Terry Tao Ye*
2018 IEEE International Conference on Service Operations and Logistics, and Informatics (SOLI), Singapore, Jul. 2018, pp. 118–122.

Book Chapters

1. **Antennas Manufactured from Conductive Fabric Materials**
Terry Tao Ye, Mengxia Yu, **Yulong Liu**, Anna Pui Yi Lau, and Hai Tao Si
in *Materials in Advanced Manufacturing*, CRC Press, 2022, pp. 339–367.

Workshop Papers

1. **Embroidered Inductive Strain Sensor for Wearable Applications**
Yulong Liu, Miao Wang, Mengxia Yu, Bingyi Xia, and Terry Tao Ye*
2020 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops), Austin, TX, USA, Mar. 2020.

2. **Fabrics-Based Embroidered Passive Displacement Sensors for On-Body Applications**
Yulong Liu, Miao Wang, Bingyi Xia, and Terry Tao Ye*
International Conference on Embedded Wireless Systems and Networks (EWSN) 2020 Workshop on OBSN, Lyon, France, Feb. 2020, pp. 230–235.

† Equal contribution. * Corresponding author.