Zitong Lan

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Education

- **Honors college(Chien-Shiung Wu College), Southeast University** Nanjing, China
  B.Eng. in Information Engineering **GPA**: 92.4 (3.96/4) **rank**: 4/158 *Sep. 2019 - Jun. 2023*
  A Courses: Algebra (99), Data Structure (97), Physics (97), Digital Signal Processing (96), Calculus (95), Analog Circuit (94,1/130), Communication Systems(94) and 20+ others.

Publications

- **Quantum Wireless Sensing: Principle, Design and Implementation**
  Fusang Zhang, Beihong Jin, **Zitong Lan**, Zhaoxin Chang, Daqing Zhang, Yuechun Jiao, Meng Shi, Jie Xiong.
  Conditionally Accepted to *Mobicom'23*
- **Exploring quantum wireless sensing for fine-grained liquid recognition**
  On going effort
- **Autoethnography of Arduino Developers in Realizing Intermittent Computing**
  Zitong Lan, Yang Zhang.
  In submission
- **BLEselect: Gestural IoT Device Selection via Bluetooth Angle of Arrival Estimation from Smart Glasses**
  Tengxiang Zhang, **Zitong Lan**, Chenren Xu, Yanrong Li, Yiqiang Chen.
  ACM IMWUT Vol. 6/*UbiComp* 2023.
- **PCCR Based Wheelchair Control System**
  Zhenhao Ji, Yu Tian, Jifu Wang, Mingyuan Ding, Haoxin Wang, Yifan Chen, Jiahao Wen, **Zitong Lan** et. al.
  IEEE Circuits and Systems Magazine, the third-quarter 2021.

Research Experience

- **Quantum wireless sensing about principle and application in liquids detection** *Aug. 2022 - Present*
  UMass Amherst Amherst, USA
  Remote Research Intern, advised by Prof. **Jie Xiong** and **Fusang Zhang** (CAS)
  - Proposed the prototype of a new sensing modality employing Rydberg atoms as signal receiver. Presented its principles and design with sensitivity enhancement methods to achieve wireless sensing with super high SNR.
  - The system outperforms conventional RF sensing at 2.4 G by more than 10 times in terms of sensing granularity and provide fine-grained application like using centimeter-wave to sense sub-millimeter vibration of a speaker.
  - The system is compatible with commodity RF devices like WiFi and enhance their sensing ability. By changing the Rydberg state, the Rydberg atom can serve as a nearly full-band receiver.
  - Leveraged the quantum wireless sensing to detect liquids with super fine-grained granularity on liquids detection task. Make the
- **Realizing Intermittent Computing on Arduino Platform** *Oct. 2022 - Jan. 2023*
  University of California, Los Angeles Los Angeles, USA
  Remote Research Intern, advised by Prof. **Yang Zhang**
  - Enabled intermittent computing programming on Arduino (i.e. Mega 2560 Rev3) using non-volatile memory EEPROM. Inserted checkpoints to program to make it restore the state from the latest checkpoint.
  - Implemented common physical computing applications in intermittent computing, including computing, sensing, actuation and communications. Summarized common problems and obstacles in develop IC and called for future efforts in assistive features and development tools to support intermittent computing
- **BLEselect: IoT Device Selection via BLE AoA Estimation from Smart Glasses** *May. 2021 - Aug. 2022*
  Institute of Computing Technology, Chinese Academy of Sciences Beijing, China
  Research Intern, advised by Prof. **Tengxiang Zhang**
  - Proposed a natural, accurate, privacy-preserving IoT device selection method, which leverages the direction finding feature in BLE Protocol 5.0 and improves the user experience for device selection.
  - Designed a 5-element antenna array that fits on the frame of smart glasses, developed a device selection pipeline that trains light-weight SVM models in real-time to enable precise selection(3m $>$ 90% accuracy).
  - Implemented a prototype system ($< 10mW$) that supports three natural gestures of device selection, conducted extensive experiments and user studies (96.7% correctness).
- **PCCR Based Wheelchair Control System** *May. - Oct. 2020*
  School of Information Science and Engineering, Southeast University Nanjing, China
  Research Intern, advised by Prof. **Chuan Zhang**
  - Designed the PCCR technology based wheelchair control system to help patients with severe disabilities use eye movements to control wheelchair safely, effectively and naturally.
  - Analyzed the real driving response and proposed a unique interaction method for users to control the locomotion of wheelchair and make phone call through different eye movements.

Honors and Awards

- Outstanding Graduates in Southeast University (5%) *JUN. 2023*
- The Final Winner (1^{st}) in the 2019-2020 IEEE CASS Student Design Competition *SEP. 2020*
- The Southeast University President Scholarship (2%) *Fall 2020*
- The Second Award in the Chinese Mathematics Competition *NOV. 2020*

Skills Summary

- **Programming languages**: Matlab, C++, C, Python, Verilog
- **Software**: Matlab, Gnu-Radio, LaTeX, Vivado
- **English Test**: TOEFL iBT: 104(s23), GRE: V-156 Q-170 AW-3.5