LIANG JIAXIN

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PERSONAL SUMMARY

- Possess a solid command of the SparkLink and Bluetooth standards, with extensive performance-tuning experience, and hands-on expertise in building a complete low-power protocol stack from scratch.
- Solid understanding of mainstream wireless standards (Wi-Fi IEEE 802.11a/b/g/n/ac/ax, Bluetooth) and practical protocol stacks.
- Extensive experience in end-to-end wireless network system design and prototyping for Industrial Internet of Things (IIoT), with SDR-based implementation (USRP/GNU Radio).

EDUCATION

Ph.D. Candidate in Information Engineering *Aug. 2015 - Oct. 2021*
Department of Information Engineering
The Chinese University of Hong Kong (CUHK), Hong Kong
Advisor: Prof. Liew Soung-Chang, *Fellow, IEEE*

B.E. in Information Engineering *Sep. 2013 - Jun. 2015*
Department of Information Engineering
The Chinese University of Hong Kong (CUHK), Hong Kong

Visiting Scholar *Sep. 2018 - Feb. 2019*
McCormick School of Engineering
Northwestern University (NWU), Illinois, United States
Advisor: Prof. Guo Dongning, *Fellow, IEEE*

RESEARCH EXPERIENCE

Selected Projects

Wireless Time-Sensitive Network (TSN) for IIoT *Mar. 2019 - Feb. 2020*

· Designed and implemented a real-time TSN-enabled wireless system on PC–USRP using GNU Radio, providing time-aware services to upper-layer applications.
· Achieved sub-100 ns network-wide time synchronization and reduced end-to-end latency to 3.75 ms.
· Built a reconfigurable, deployable prototype for time-critical industrial wireless applications.
· Exposed application interfaces via TUN/TAP for data exchange and integration.

Network-Coded Multiple Access on Unmanned Aerial Vehicle *Feb. 2018 - Aug. 2018*

· Designed and implemented an SDR-based wireless prototype on DJI Matrice 600 for airborne experiments.
· Integrated the embedded USRP E312 for over-the-air transmission/reception and algorithm validation.

A Generic Real-Time Time-Slotted System on SDR (RTTS-SDR) *Sep. 2015 - Jan. 2017*

· Built a full-stack real-time time-slotted SDR system (USRP + GNU Radio) to validate MAC/PHY designs (e.g., coded slotted ALOHA, physical-layer network coding, compute-and-forward).
· Served as a reusable experimental platform supporting multiple projects in the research group.

Design and Implementation of High Performance Decoders for Next Generation Wireless Systems *Aug. 2014 - May. 2015*

· Implemented a reduced-complexity convolutional decoder for Physical-layer Network Coding (PNC) in GNU Radio.
· Built the first single General Purpose Processor based development environment for PNC with a video streaming demonstration.

Competition

DARPA Spectrum Collaboration Challenge (SC2) *Nov. 2016 - Feb. 2019*

· Participated in a collaborative ML competition focused on improving RF spectrum utilization.
· Developed an SDR-based real-time wireless system supporting application traffic with high reliability and low latency.
· Collaborated with Prof. Dongning Guo's research group at Northwestern University.
· Qualified for Preliminary Events 1&2 (PE1&2) and presented at events hosted by Johns Hopkins University Applied Physics Laboratory.

PUBLICATIONS

Journal

- T. Li, Y. Ding, **J. Liang***, K. Zheng, X. Zhang, T. Pan, D. Wang, K. Xu, "Toward optimal broadcast mode in offline finding network", *IEEE Transactions on Mobile Computing*. 2025. (*Corresponding Author)
- B Liu, Z Ren, Y Zhang, M Li, **J Liang**, B He, J Li, H Wu, J Zhou, "Unveiling SparkLink Low Energy: a Comparative Measurement Study", *ACM Transactions on Internet of Things*. 2025.
- **J. Liang**, T.T. Chan, H. Pan, "Minimizing Age of Collection for Multiple Access in Wireless Industrial Internet of Things", *IEEE Internet of Things Journal*, 2023.
- **J. Liang**, S. C. Liew, "ROFA: An OFDMA system for Ultra-Reliable Wireless Industrial Networking", submitted to *IEEE Transactions on Mobile Computing*, 2021.
- T. T. Chan, H. Pan, and **J. Liang**, "Age of Information with Joint Packet Coding in Industrial IoT", *IEEE Wireless Communication Letter*, 2021.
- **J. Liang**, H. Chen, S. C. Liew, "Design and Implementation of Time-Sensitive Wireless IoT Networks on Software-Defined Radio", *IEEE Internet of Things Journal*, 2020.
- **J. Liang**, H. Pan, S. C. Liew, "Is Multichannel Access Useful in Timely Information Update?", *IEEE Wireless Communication Letter*, 2020.
- H. Pan, **J. Liang**, S. C. Liew, "Practical NOMA-based Coordinated Direct and Relay Transmission", *Wireless Communication Letter*, 2020.
- H. Pan, **J. Liang**, S. C. Liew, V. Leung, J. Li, "Timely Information Update with Non-Orthogonal Multiple Access", *IEEE Transactions on Industrial Informatics*, 2020.
- H. Pan, S. C. Liew, **J. Liang**, V. Leung, J. Li, "Coding of Multi-Source Information Streams with Age of Information Requirements", *IEEE Journal on Selected Areas in Communications*, 2020.
- Y. Shao, S. C. Liew and **J. Liang**, "Sporadic Ultra-Time-Critical Crowd Messaging in V2X", *IEEE Transactions on Communications*, 2020.
- H. Pan, S. C. Liew, **J. Liang**, Y. Shao and L. Lu, "Network-Coded Multiple Access on Unmanned Aerial Vehicle", *IEEE Journal on Selected Areas in Communications*, 2018.

Conference

- T. Li, **J. Liang***, Y. Ding, K. Zheng, X. Zhang, and K. Xu,"On Design and Performance of Offline Finding Network", *IEEE INFOCOM*, 2023.
  (*Corresponding Author)
- T. Li, B. Hu, J. Shuai, **J. Liang**, Y. Ding, Z. Li, and K. Xu, "Accelerating BLE Neighbor Discovery via Wi-Fi Fingerprints", *IEEE INFOCOM Demo*, 2023.
- Q. Ren, T.T. Chan, **J. Liang**, and H. Pan, "Age of Information in SIC-based Non-Orthogonal Multiple Access", *IEEE Wireless Communications and Networking Conference (WCNC)*, 2022.
- Y. Ding, T. Li, **J. Liang**, and D. Wang, "Blender: Toward Practical Simulation Framework for BLE Neighbor Discovery", *ACM Modeling Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, 2022.
- J. Feng, H. Pan, T.T. Chan, and **J. Liang**, "Timely Status Update: Should ARQ be Used in Two-Hop Networks?", *IEEE GLOBECOM*, 2022.
- G. Chen, T. -T. Chan, H. Pan and **J. Liang**, "DNN-aided Low-complexity Physical-layer Network Coding Enabled Non-orthogonal Multiple Access", *2022 IEEE 19th Annual Consumer Communications & Networking Conference (CCNC)*, 2022.
- Z. Han*, **J. Liang***, Y. Gu, H. Chen, "Software-Defined Radio Implementation of Age-of-Information-Oriented Random Access". *IEEE IECON*, 2020.
  (*two authors have equal contributions.)
- Y. Shao, S. C. Liew, and **J. Liang**, "Sporadic Ultra-Time-Critical Messaging in V2X". *IEEE ICC*, 2018.
- R. Y. Y. Chan, C. K. Y. Chan, M. Tahernia, **J. Liang**, and Q. Cao, "Engineering Education for Sustainable Development and Global Citizenship: A Course-level Implementation Case in Hong Kong". *American Society for Engineering Education (ASEE) Annual Conference*, Salt Lake City, UT, 2018.
- R. Y. Y. Chan, C. K. Y. Chan, C. Lau, **J. Liang**, H. Huang, Q. Cao, and M. Tahernia, "Direct evidence of engineering students' generic skills learning: From research to practice in an undergraduate course in information engineering". *2017 IEEE Frontiers in Education Conference (FIE)*, Indianapolis, IN, 2017.

HONORS AND AWARDS

- DARPA SC2 Competition: Finalist (Preliminary Events 1&2) *2019*
- Overseas Research Attachment Programme, Faculty of Engineering (CUHK) *2018*
- Best Teaching Assistant Award, Department of Information Engineering (CUHK) *2018*
- C.F. Hu Memorial Scholarship *2015*

PROFESSIONAL SERVICES

- **Journal reviewer**
  - IEEE Journal on Selected Areas in Communications (J-SAC)
  - IEEE Transactions on Communications (TCom)
  - IEEE Wireless Communication Letter
  - IEEE Access
  - KSII Transactions on Internet and Information Systems
- **Conference Reviewer**
  - IEEE ICC
  - IEEE Globecom
  - IEEE WCNC
  - IEEE VTC
  - IEEE PIMRC

SKILLS

Programming

- C/C++, Python, MATLAB

SDR & Systems

- GNU Radio, UHD, USRP
- Linux systems programming

Languages

- Cantonese *Native*
- Mandarin *Native*
- English *Fluent*