

Ruirong Chen

CONTACT INFORMATION

3700 O'Hara St, Pittsburgh, PA 15213
Dept. of Electrical and Computer Engineering
University of Pittsburgh
Pittsburgh, PA, 15213

Telephone: (352)284-1296
Email: Ruirongchen25@163.com
<https://mmcruirong.github.io/RuirongChen.github.io/>

RESEARCH INTERESTS

Wireless networking, Wireless Sensing, Internet of Things, Smart Health

EDUCATION

University of Pittsburgh, Pittsburgh, PA expected May 2022
Ph.D., Electrical and Computer Engineering
Dissertation: Enabling next-generation wireless networks with custom and commodity PHY designs
Advisor: Prof. Wei Gao

University of Florida, Gainesville, FL May 2017
M.S., Electrical and Computer Engineering

Harbin Institute of Technology, Harbin, Heilongjiang, July 2015
B.E., Communication Engineering

RESEARCH EXPERIENCE

Research Assistant 2017-present
Dept. of Electrical and Computer Engineering, University of Pittsburgh

- Developed and implemented a system that enables real-time emulation for custom PHY signals without hardware modifications. Such emulation allows custom PHY designs to operate in commodity devices via controlled MAC payloads.
- Developed and implemented a new Wireless Physical layer design that enables cross-technology coexistence between different wireless technologies. Such PHY design enables ultra-low latency communications for all coexisted wireless technologies.
- Designed a wireless side channel that enables low latency and collision free communications in a congested wireless channel. The side channel operates independently without impacting main channel performance and achieves 2.5Mbps throughput.

Lead Graduate Student 2019-2021
Mobile Systems and Networking Laboratory, University of Pittsburgh

Research Assistant 2015-2017
Dept. of Electrical and Computer Engineering, University of Florida

- Designed and built an acoustic underwater communication modem and operational electronic system for a compact AUV. The system enabled motor control, optical communication, and wireless communication.

PUBLICATIONS

Conference Papers

1. **Ruirong Chen**, and Wei Gao. "StarLego: Enabling Custom Physical-Layer Wireless over Commodity Devices." In Proceedings of the 21st International Workshop on Mobile Computing Systems and Applications (HotMobile), pp. 80-85. 2020.
2. **Chen, Ruirong**, and Wei Gao. "Enabling cross-technology coexistence for extremely weak wireless devices." In IEEE INFOCOM 2019-IEEE Conference on Computer Communications (INFOCOM), pp. 253-261. IEEE, 2019.
3. **Chen, Ruirong**, Haoyang Lu, and Wei Gao. "Minimizing wireless delay with a high-throughput side channel." IEEE Transactions on Mobile Computing 19, no. 7 (2019): 1634-1648.

4. Lu, Haoyang, **Chen, Ruirong**, and Wei Gao. "EasyPass: combating IoT delay with multiple access wireless side channels." In Proceedings of the 15th International Conference on Emerging Networking Experiments and Technologies (CoNEXT), pp. 186-199. 2019. (Best Paper Award)
5. Song, Xingzhe, Boyuan Yang, Ge Yang, **Chen, Ruirong**, Erick Forno, Wei Chen, and Wei Gao. "SpiroSonic: monitoring human lung function via acoustic sensing on commodity smartphones." In Proceedings of the 26th Annual International Conference on Mobile Computing and Networking (MobiCom), pp. 1-14. 2020.
6. Li, Yuqi, **Chen, Ruirong**, Xingzhe Song, Wei Gao, Wei Chen, and Erick Forno. "Device-Free Acoustic Motion Tracking over Targets with Large Sizes." In 2019 IEEE 16th International Conference on Mobile Ad Hoc and Sensor Systems (MASS), pp. 447-455. IEEE, 2019.
7. Song, Zhuoyuan, Cameron Mazzola, Eric Schwartz, **Chen, Ruirong**, Julian Finlaw, Mike Krieg, and Kamran Mohseni. "A compact autonomous underwater vehicle with cephalopod-inspired propulsion." Marine Technology Society Journal 50, no. 5 (2016): 88-101.

In Submission

PUBLIC SPEAKING Presentations

1. StarLego: Enabling Custom Physical-Layer Wireless over Commodity Devices, *the 21st International Workshop on Mobile Computing Systems and Applications (HotMobile)*, Austin, Tx, MAR 2020.
2. EasyPass: Combating IoT delay with multiple access wireless side channels, *the 15th International Conference on Emerging Networking Experiments and Technologies (CoNEXT)*, Orlando, Florida, Dec 2019
3. Enabling cross-technology coexistence for extremely weak wireless devices, *IEEE Conference on Computer Communications (INFOCOM) 2019*, Paris, France, May 2019.

TEACHING AND MENTORING EXPERIENCE

Teaching:

- **Teaching assistant**, ECE0132 - Digital Logic Fall 2017
Dept. of Electrical and Computer Engineering, University of Pittsburgh
- **Teaching assistant**, ECE0501 - Digital Systems Laboratory Spring 2018
Dept. of Electrical and Computer Engineering, University of Pittsburgh
- **Teaching assistant**, ECE1160 - Embedded Computer System Design 1 fall 2018
Dept. of Electrical and Computer Engineering, University of Pittsburgh
- **Teaching assistant**, ECE2161 - Embedded Computer System Design 2 spring 2019
Dept. of Electrical and Computer Engineering, University of Pittsburgh

Mentoring:

- **Ph.D. students:**
 - Xiangyu Ying, research on acoustic Pulmonary diseases monitor system on mobile phones
 - Huang Kai, research on energy efficient backsactter system with Neural Networks
 - Yuqi Li, project on developing asthma monitoring system on mobile phones

HONORS AND AWARDS

- Best Research Assistant**, Dept. of Electrical and Computer Engineering
University of Pittsburgh *Mar. 2020*
- Student Travel Grant**, ACM
ACM HotMobile 2020 *Feb. 2020*
- Best Paper Award**, ACM
ACM CoNEXT 2019 *Dec. 2019*

Student Travel Grant, IEEE

IEEE INFOCOM 2019

May. 2019

PROFESSIONAL
ACTIVITIES

Journal Reviewer

- IEEE Transactions on Mobile Computing
- IEEE Transactions on Vehicular Technology
- ACM Transactions on Sensor Networks
- Elsevier Physical Communication

Conference Reviewer

- IEEE Conference on Computer Communications (INFOCOM), 2019,2020