Pedram Kheirkhah Sangdeh

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SUMMARY

- A Ph.D. student in CS, skilled in wireless communications, signal processing, and machine learning.
- Interested in design, analysis, and implementation of intelligent protocols for WLANs, 5G, and beyond.
- Published a book chapter and 15 research papers in ToN, MobiHoc, INFOCOM, TWC, TCOM, etc.

TECHNICAL SKILLS

- **Core skills**: Wireless communications, networking, signal processing, and machine learning.
- **Technologies**: WLAN, Cellular, Wi-Fi (IEEE 802.11 ax/be), 5G NR, 3GPP LTE, 802.11p, mmWave.
- **Platforms and packages**: Python, MATLAB, C++, PyTorch, CVX, CVXOPT, and GNU Radio.
- **Techniques:** MIMO, OFDM, detection, estimation, sensing, reinforcement learning, and federated learning.

EDUCATION

PhD in Computer Science	Michigan State University	2017-present
MS in Electrical and Computer Engineering	University of Tehran	2011-2014
BS in in Electrical and Computer Engineering	University of Science and Technology	2006-2011

EXPERIENCE

- **Digital Wireless Communications Lab, East Lansing, MI** (Aug. 2017 - Present)
  Research Fellow,

  Duties: Research on wireless communications and machine learning including protocol design, theoretical analysis, system implementation (PHY and MAC), field test, data collection, etc.

  Achievements:
  - **Learning-based multiplexing** for MU-MIMO-OFDMA mode in Wi-Fi networks.
  - A low-overhead **learning-based channel sounding** for Wi-Fi Networks.
  - A **blind spectrum sharing** solution for OFDM-based systems (Wi-Fi and LTE).
  - Prototype of a protocol enabling **Wi-Fi** APs to simultaneously serve **IoT devices**.
  - A framework enabling non-orthogonal multiple access (**NOMA**) **in Wi-Fi networks**.
  - Concurrent spectrum utilization for **D2D** and **5G NR** communications.
  - Design of a decoder for asynchronous uplink packets in **distributed MIMO** routers.
  - Co-channel interference mitigation in **interference among densely deployed Wi-Fi Routers**.
  - Design and operating **lab-scale networks** using USRP, clock, switches, spectrum analyzer, etc.

SELECT PUBLICATIONS

1. H. Zeng, H. Pirayesh, **P. Kheirkhah Sangdeh**, and A. Quadri, "VehCom: Delay-guaranteed message broadcast for large-scale vehicular networks," IEEE Transactions on Wireless Communications, 2021.
2. **P. Kheirkhah Sangdeh**, H. Pirayesh, A. Quadri, and H. Zeng, "A practical spectrum sharing Scheme for cognitive radio networks: Design and experiments," *IEEE/ACM Transactions on Networking*, vol. 28, no. 4, pp. 1818–1831, Aug. 2020.
3. **P. Kheirkhah Sangdeh**, H. Pirayesh, A. Mobiny, and H. Zeng, "LB-SciFi: Online learning-based channel feedback for MU-MIMO in wireless LANs," in *Proc. of IEEE ICNP*, 2020.
4. A. Quadri, H. Pirayesh, **P. Kheirkhah Sangdeh**, and H. Zeng, "TCCI: Taming co-channel interference for wireless LANs," in *Proc. of ACM MobiHoc*, 2020, pp. 251–260.
5. **P. Kheirkhah Sangdeh**, H. Pirayesh, Q. Yan, K. Zeng, W. Lou, and H. Zeng, "A downlink NOMA scheme for wireless LANs," in *IEEE Transactions on Communications*, vol. 68, no. 4, pp. 2236–2250, Apr. 2020.
6. **P. Kheirkhah Sangdeh**, H. Pirayesh, H. Zeng and H. Li, "A practical underlay spectrum sharing scheme for cognitive radio networks," in *Proc. of INFOCOM*, Paris, France, 2019, pp. 2521–2529.
7. H. Pirayesh, P. Kheirkhah Sangdeh, and H. Zeng, "EE-IoT: An Energy-Efficient IoT Communication Scheme for WLANs," in *Proc. of INFOCOM*, Paris, France, 2019, pp. 361–369.