Siavash Barqi Janiar

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Education

York University — Sep. 2021 – Apr. 2023
Master of Applied Science in Electrical Engineering and Computer Science (GPA: A+) — Toronto, ON
- Nominated for the University's Best Thesis of the Year.

Amirkabir University (Tehran Polytechnic) — Sep. 2016 – Apr. 2021
Bachelor of Science in Electrical Engineering (GPA: 8.4 / 10) — Tehran, Iran

Experience

Wireless Network Security Researcher — Sep. 2016 – Apr. 2023
Ping Wang (York University), Vahid Pourahmadi (Amirkabir University) — Toronto, ON
- Proposed a **transfer learning (TL)** method based on feature extraction to estimate **jamming patterns** in a wireless network. Reduced the time complexity of the models **by x30**.
- Realized a comprehensive **explainable artificial intelligence (XAI)** method composed of different feature extraction, pattern recognition, and rule learning algorithms for wireless network **security** in **physical layer**.
- Improved the **transparency** of the model compared to the benchmark explainable models **by 17%**, while having **32% less error**.
- Implemented comprehensive simulation realizing **WiFi-LTE** coexistence in **5GHz unlicensed band**.
- Developed a double Q-iteration algorithm decreasing the **collision rate** of the secondary users in a **cognitive radio** network **by 24%** compared to the legacy protocols.
- Realized an efficient ML-based MAC protocol for frequency **resource allocation** outperforming the **slotted ALOHA** protocol with **nearly 60%** better network throughput.
- Leveraged an online actor-critic ML algorithm for access problems in **heterogeneous wireless networks** achieving **95% throughput** in the network marked as the highest possible performance.

Communication Network Engineer - Internship — May 2017 – Apr. 2018
The Institution of Information and Communications Technology (ICT) — Tehran, Iran
- Conducted in-depth research and analysis of communication regulations, policies, and industry **standards (ITU-T, 3GPP)** to ensure compliance with local and international regulatory frameworks.
- Prepared comprehensive **regulatory** compliance reports, outlining key findings, implications, and recommended actions for stakeholders.
- Achieved **a 100% compliance** rating in regulatory audits and assessments, ensuring adherence to communication regulations and mitigating legal and financial risks.

Projects (Selected) [https://siavashbarqijaniar.github.io/projects.html]

Wi-Fi (802.11) Network Optimization:
- Optimized the digital communication link's performance by adjusting the **modulation scheme** and **SNR**.
- Compared **BPSK, QPSK, 16-QAM** modulation schemes and assessed their impact on the link's **SER** at various **SNR** levels.
- Evaluated the trade-off between modulation complexity and performance of the communication link, considering **error tolerance**, **bandwidth efficiency**, **channel capacity**, and **receiver complexity**.
- Evaluated the impact of different channel coding schemes including a **Trellis coded modulation** scheme.

Client-Server Architecture:
- Developed a server-side component that handles user registration, authentication, and message routing using **WebSocket**.
- Created a client-side component for the mobile application using **thread programming** that enables users to send and receive encrypted messages.
- Utilized **SSL/TLS** encryption protocol to secure data transmission and protect sensitive information from unauthorized access.

Wireless Network Monitoring and Security:
- Conducted a **Wi-Fi** network attack to crack **WPA2 and WEP** networks using **AirCrack-ng** for the purpose of testing the security level of the network.
- Monitored and recorded the network activity with **Wireshark** and prepared comprehensive reports about the network logs.

Skills

- **Programming Languages:** Python, Go, SQL, Spark, C/C++, C#, R, MATLAB, Java, Linux, Git, LaTeX, JS, CSS, HTML, PHP.
- **Frameworks and Protocols:** HTTP, SMTP, FTP, AirCrack-ng, SSL/TLS, WEP/WPA2, Tensorflow, Keras, PyTorch, Sci-kit Learn.
- **Cloud Tools:** Docker, AWS, GCP, Microsoft Azure.
- **Software:** Vivado, Simulink, Quartus, ADS.

Publications (Selected)

- S. B. Janiar, P. Wang, "Intelligent Anti-jamming based on Deep Reinforcement Learning and Transfer Learning," *IEEE Transactions on Vehicular Technology*, 2023.
- Barqi Janiar S, Pourahmadi V, "Deep-reinforcement learning for fair distributed dynamic spectrum access in priority buffered heterogeneous wireless networks," *IET Commun. 2021;19*. https://doi.org/10.1049/cmu2.12098