

# Hamed Hojatian

6G/AI Research Engineer

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## Education

2019-2023	<b>University of Montreal (Polytechnique Montréal)</b> <i>Ph.D. in AI-aided wireless communication systems</i> <b>Supervisors:</b> Prof. François Leduc-Primeau, Prof. Jean-François Frigon <i>GPA: 4.0/4.0</i>
2014-2017	<b>Isfahan University of Technology (IUT)</b> <i>M.Sc. in communication system engineering</i> <b>Supervisor:</b> Prof. Mohammad Javad Omid <i>GPA: 3.7/4.0</i>
2010-2014	<b>Babol (Noshirvani) University of Technology (NIT)</b> <i>B.Sc. in electrical engineering</i> <b>Supervisor:</b> Prof. Hossein Miar-Naeimi <i>GPA: 3.1/4.0</i>

## Research skills and Qualifications

- Strong proficiency in machine learning techniques such as regression, classification, clustering, and neural networks;
- Skilled in developing and implementing machine learning algorithms using a range of techniques, including supervised learning, unsupervised learning, and reinforcement learning;
- Understanding of deep reinforcement learning techniques, with experience implementing and optimizing various algorithms such as Q-learning, and deep deterministic policy gradients (DDPG);
- Experience with massive MIMO, beamforming techniques, coordinated beamforming, distributed antennas, cell-free communication and their applications in wireless communication systems, 5G beyond, and 6G;
- Experience in developing and implementing deep learning-based beamforming solutions, with a focus on optimizing beamforming performance for wireless communication systems;
- Skilled in using quantization techniques to optimize deep neural networks (DNNs) for specific hardware constraints and other use cases;
- Developed and implemented machine learning models for wireless communication systems, including channel estimation, interference cancellation, and beamforming;
- Published research papers in leading IEEE journals conferences;
- Collaborated with cross-functional teams to identify research opportunities and develop solutions that improved the reliability, efficiency, and scalability of wireless communication systems;
- Mentored graduate and undergraduate students on research projects and provided guidance on technical skills and research methodologies;

## Skills

Tools and Languages | Python, Pytorch, C++ (intermediate), MATLAB, and Microsoft Office.

Languages | English, French (basic), Persian (native)

## Research Experience

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- Ph.D. | **AI-aided Beamforming in Massive MIMO Systems**
- Designing hybrid beamforming techniques for wireless networks, including an innovative RSSI-based hybrid beamforming design that leverages deep learning algorithms to enhance spectral and energy efficiency;
  - Developing unsupervised learning techniques for intelligent beamforming and coordinated hybrid beamforming in cell-free massive MIMO systems;
  - Exploring subarray hybrid beamforming and efficient hardware design driven by unsupervised learning techniques, to reduce the complexity of wireless communication systems;
  - Publishing in top-tier conferences and journals in the field of wireless communications, my research showcases my expertise in developing cutting-edge technologies to improve wireless network performance;
  - Filing a patent for the invention in collaboration with Ericsson as a co-op research intern, I developed a novel AI-aided method for efficient massive MIMO beamforming.

## Work Experience

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- Nov 2023 - present | **Huawei Technologies Ltd**  
*Research Engineer*
- Air interface, PHY layer, 6G/AI, signal processing, ...
- Nov 2022 - Nov 2023 | **Ericsson**  
*Research intern, Co-op research*
- Energy efficiency project in Global Artificial Intelligence Accelerator (GAIA)
- Mar 2019 - Aug 2019 | **Polytechnique Montréal**  
*Research Assistant*
- Nov 2015 - Nov 2018 | **Mobile Telecommunication Company of Iran (MCI)**  
*Radio planning and optimization engineer*
- Live network Ericsson OSS optimization and parameter tuning for 2G, 3G, and LTE;
  - Network Planning and optimization for 2G, 3G, and LTE, new site baseline parameters tuning and planning;

## Awards

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2024 | Best thesis award nomination “Beamforming design for massive MIMO systems with deep neural networks”

## Mentoring

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Throughout my Ph.D. studies, I had the privilege of mentoring one Ph.D., two master students, and one internship student in our research project on wireless communication systems by providing guidance and support in their research work.

## Community Service

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IEEE Journals reviewer | Selected Areas in Communications (**J-SAC**), Transactions on Wireless Communications (**TWC**), Transactions on Communications (**TCOMM**), Wireless Communications Letters (**WCL**), Communications Letters (**CommL**), and Transactions on Vehicular Technology (**TVT**). Details in [here](#).

## Talks and Teaching Experience

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- 2022 | Paper Presentation, **IEEE GLOBECOM 2022**, Rio-de-Janeiro, Brazil.  
Hybrid-Seminars on Selected Topics in Signal Processing.  
Presenting my research progress in **IVADO - Digital October**.
- 2021 | Presenting my research progress in **IVADO - Digital October**.
- 2020 | Paper Presentation, **IEEE ICC 2020**, Dublin, Ireland.  
Presenting my research topic in **IVADO - Digital October**.
- 2013 | Teaching assistant for **Electronic I**.  
Teaching assistant for **Electronic circuit I**.
- 2012 | Teaching assistant for **Digital Signal Processing**.

## Certificates

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- 2022 | Introduction to Unix Shell, **Calcul Quebec**.  
Massive data analysis with Spark, **Calcul Quebec**.  
Introduction to GPU Programming with Python, **Calcul Quebec**.
- 2019 | 4<sup>th</sup> **IVADO/MILA SCHOOL IN DEEP LEARNING**.
- 2018 | DEEP LEARNING WITH PYTORCH, **Udemy**.  
LTE OPTIMIZATION OF RADIO NETWORK (3GPP), **TechCom**.
- 2017 | LTE COUNTER AND KPI (ERICSSON), **TechCom**.  
LTE RADIO NETWORK PLANNING, **TechCom**.

## Publications

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- 2024 | 1. Hasanzadeh Karkan, A., **Hojatian, H.**, Frigon, J.-F. & Leduc-Primeau, F. “**SAGE-HB: Swift Adaptation and Generalization in Massive MIMO Hybrid Beamforming**”. *Accepted IEEE International Conference on Machine Learning and Computer Networking (ICMLCN) 2024* (2024).
- 2023 | 2. **Hojatian, H.**, Mlika, Z., Nadal, J., Frigon, J.-F. & Leduc-Primeau, F. “**Learning Energy-Efficient Transmitter Configurations for Massive MIMO Beamforming**”. *submitted IEEE Transactions on Machine Learning in Communications and Networking* (2023).
- 2022 | 3. **Hojatian, H.**, Nadal, J., Frigon, J.-F. & Leduc-Primeau, F. “**Decentralized Beamforming for Cell-Free Massive MIMO with Unsupervised Learning**”. *IEEE Communications Letters* (2022).  
4. **Hojatian, H.**, Nadal, J., Frigon, J.-F. & Leduc-Primeau, F. “**Flexible Unsupervised Learning for Massive MIMO Subarray Hybrid Beamforming**”. *IEEE GLOBECOM* (2022).
- 2021 | 5. **Hojatian, H.**, Nadal, J., Frigon, J.-F. & Leduc-Primeau, F. “**Unsupervised Deep Learning for Massive MIMO Hybrid Beamforming**”. *IEEE Transactions on Wireless Communications* (2021).
- 2020 | 6. **Hojatian, H.**, Nguyen Ha, V., Nadal, J., Frigon, J.-F. & Leduc-Primeau, F. “**RSSI-Based Hybrid Beamforming Design with Deep Learning**”. *IEEE ICC* (2020).
- 2016 | 7. **Hojatian, H.**, Omid, M. J., Saeedi-Sourck, H. & Farhang, A. “**Joint CFO and Channel Estimation in OFDM-based Massive MIMO Systems**”. *IEEE IST* (2016).

## Patent

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2023 | H. Hojatian, Z. Mlika, J. Nadal, J. Frigon and F. Leduc-Primeau, “**Learning Energy Efficient Massive MIMO Beamforming**”, U.S. patent, filed by Ericsson, PCT/IB2023/053214.

## Strengths

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Hard-working, Decision Making, Ability to Work Under Pressure, Motivator & Leader Conflict Resolution, Time Management, Target oriented, Flexibility, and Adaptability