

Javad Shabanpour

Proactive and solution-oriented ML Radio Research Scientist at Nokia Bell Labs and Marie Curie PhD Alumnus from Aalto University, with 8+ years of research experience and 4+ years of expertise in AI-driven wireless systems, data-driven optimization, and physics-aware channel modeling. Skilled in spiking neural networks, machine learning and AI-based modeling, ray-tracing-based simulation, and hardware-validated RF design, with 25+ publications advancing 5G/6G network intelligence.

 Email |  LinkedIn |  Google Scholar

Education

- **Ph.D.**, Aalto University, Espoo, Finland (2021 – 2025),
GPA: 5/5 | **Focus:** AI-enabled optimization of wireless networks through data-driven channel calibration, site-specific propagation modeling, and digital-twin-based performance prediction.
- **M.Sc.**, Iran University of Science & Technology, Tehran, Iran (2017 – 2020)
GPA: 3.91/4 | **Focus:** RF/microwave circuits modeling, and EMI/EMC engineering. RF filters and antenna design.
- **B.Sc.**, Babol Noshirvani University, Iran (2012 – 2016)
GPA: 3.88/4 | **Final Project:** Design microstrip antennas using FDTD method.

Experience

- **ML Radio Research Scientist**, Nokia Bell labs, Espoo, Finland (2025 - Present)
 - **AI-Based Neural Receiver Design for 6G Networks:** Developing machine learning-based receiver architectures such as spiking neural networks (SNNs), deep neural models, and generative AI frameworks for data-driven signal detection and channel decoding. The work aims to enable energy-efficient and fully learned baseband processing for next-generation wireless intelligence.
- **Research Intern**, Telefónica Research, Barcelona, Spain (2024)
 - **Data-Driven Calibration of Ray-Tracing Digital Twins:** Developed and validated an automated neural-network-based material calibration framework in Sionna, leveraging empirical London coverage data to align simulated and real-world propagation characteristics. Implemented transfer learning across multiple environments to enable scalable, physics-accurate digital twins for wireless channel simulation.
- **Early stage researcher (ESR)**, Aalto University, Espoo, Finland (2021-2024)
 - **Data-Driven Optimization of Physics-Aware Wireless Systems:** Developed a Sionna ray tracing framework for site-specific, automated data-driven optimization of wireless components using real urban coverage data to enhance network performance and deployment efficiency.
 - **Advanced Antenna Design and Experimental Validation:** Designed, fabricated, and experimentally verified reflector antenna prototypes with enhanced beamforming efficiency, angular stability, ultra-broadband operation, and dual polarization.

Selected Publications

For a complete list, please visit my  Google Scholar profile.

1. S. Beyraghi, **Shabanpour, Javad**, G. Geraci, P. Almasan, and A. Lozano, "Data-driven deployment of reconfigurable intelligent surfaces in cellular networks", *IEEE Journal on Selected Areas in Communications*, vol. 44, pp. 2938–2951, 2026.  DOI: 10.1109/JSAC.2025.3647011.
2. **Shabanpour, Javad**, X. Wang, S. Kosulnikov, and C. Simovski, "Advancing ris beamforming efficiency: Moving beyond diagonal matrix techniques", *IEEE Transactions on Vehicular Technology*, vol. 74, no. 12, pp. 18 958–18 971, 2025.  DOI: 10.1109/TVT.2025.3583421.

3. **Shabanpour, Javad**, V. Lenets, G. Lerosey, S. Tretyakov, and C. Simovski, "Engineering of intelligent reflecting surfaces: Reflection locality and angular stability", *IEEE Transactions on Antennas and Propagation*, vol. 72, no. 5, pp. 4198–4211, 2024. [DOI: 10.1109/TAP.2024.3375659](https://doi.org/10.1109/TAP.2024.3375659).

Awards & Inventions

- **Nokia-university donation funding (€100,000)** for the City2City Digital Twin Calibration project. Project proposer and main Nokia contact (2026).
- **H2020 Marie Skłodowska-Curie ITN Scholarship**, GA: No. 956256 (2021-2024).
- **Nokia Foundation Scholarship**, Helsinki (2023).
- **Travel Grant**, Foundation for Aalto University Science and Technology, Espoo (2024).
- **2022 Best-Performing Research Fellow** of the Meta-wireless ETN project, Italy (2022).
- **Invited speaker** EuCNC & 6G Summit (Gothenburg, 2023) and AES (Morocco 2025).

Invention Disclosures:

- Contributed to internal IP creation activities related to AI-native radio receivers and site-specific digital twins at Nokia Bell Labs (2025)
- Advanced Biasing and Measurement Setup for Evaluating Near-Field and Far-Field Behaviour of Re-configurable Surfaces within Parallel Plate Waveguides – Filed with Aalto University (2025)

Technical Skills

- **AI and agentic AI**
PyTorch, TensorFlow, SNN-Torch. Reinforcement learning, generative models, neural receivers. Built an LLM agent with LangChain that automates Sionna simulation runs (scenario setup, execution and result collection).
- **Ray Tracing**
Utilized **real-world datasets** for channel simulation and **data-driven validation** of urban wireless systems using Sionna RT.
- **Simulation Software & Tools**
Proficient in antenna design and analysis, RF and microwave circuit modeling, electromagnetic interference (EMI) filter design, wave-propagation simulation, and radar-system analysis. **CST Microwave Studio, ADS, HFSS, COMSOL Multiphysics.**
- **Experimental and Hardware Skills**
RF and Microwave Measurement, Beamforming and radiation-pattern evaluation, Antenna Measurement and **Prototyping**, EMC/EMI **testing** in compliance with standards.
- **Wireless and standards**
3GPP 5G NR physical layer (OFDM, MIMO, channel estimation), TR 38.901 channel models, AI/ML for the air interface (Rel-19). System-level simulation with MAC scheduling.