

João Morais

Wireless Engineer, Ph.D.

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EDUCATION

Arizona State University, USA

2021-2025

PhD, Electrical and Computer Engineering

Advised by Prof. Ahmed Alkhateeb. Mentorship from Qualcomm. Member of IEEE Eta Kappa Nu honor society. Investigating explainable AI in wireless networks. Interested in digital twins, multi-sensor experimental testbeds, data pipelines and visualization. Contributor to DeepSense6G and DeepMIMO. Favorite courses: Machine Vision and Pattern Recognition, Advanced Topics in MIMO Communications.

Delft University of Technology, Netherlands

2019-2020

Erasmus+ Exchange Program

Studied in a major European University for 6 months. Main projects: Packet scheduling in LTE networks, MIMO Channel Estimation Algorithms for Wi-Fi 802.11n in MATLAB, Indoor Localization Android app using Wi-Fi APs.

IST, University of Lisbon, Portugal

2015-2020

BSc + MSc, Electrical and Computer Engineering

Telecommunications major. 5x Recipient of Excellence Award (top 1% students each year). Member of the Radio Systems' group. Co-founder of "Talks with Potential", a series of electrical engineering talks by students.

WORK EXPERIENCE

NVIDIA, USA

Aug 2025 - now

Software Engineer, AI & 6G

Focused on 5G PHY development in Python with GPU acceleration using ahead-of-time kernel compilation. Enhance spectral efficiency. Accelerate AI-native wireless by making NVIDIA Aerial GPU stack developer friendly.

NVIDIA, USA

May 2024 - Dec 2024

Software Intern, 5G and 6G RAN AI with Digital Twin

Developed an AI channel estimation approach, tested it with Sionna, PyAerial and AODT. Tested performance over-the-air via ONNX/TensorRT. Integrated ML frameworks with product and documented open release.

TeraSpatial, USA

Jun 2022 - Dec 2022

Wireless Systems and Algorithms Engineering Intern

Design, simulate, and prototype AI/ML algorithms for millimeter-wave communication. Setup a standard-compliant private 5G NSA network with software defined radios. Study scheduling and beamforming in O-RAN.

TNO, The Netherlands

2020-2021

R&D Intern in 5G Virtual Reality Lab

Built a 5G System-level simulator for virtual reality meetings. Required a user head movement model, a spatial OFDMA multi-user scheduler, beam management procedures, and sub-6Ghz and mmWave channel modeling. Resulted in 2 patents on 5G physical layer and 1 publication in WiMob.

Delft University of Technology, Netherlands

2019

Summer Intern – Radio Controlled Car Fleet

Built a fleet of 20 cars packed with sensors (ultrasonic, LiDAR, IMU) and communications (Wi-Fi and Bluetooth) for a platooning algorithms' course.

JANZ, Portugal

2018

R&D Intern in Radio Communications Unit

Performed propagation simulations with LoRa radios in a private network. Tested radio coverage of water meter emitters with field measurements.

Technical Skills

- **AI & Machine Learning**
NumPy, SciPy, .PyTorch
 - **Ray Tracing**
Wireless InSite, Sionna
 - **Wireless Communications**
3GPP 5G, O-RAN, Wi-Fi
 - **Computer Networks**
OSI, Interfaces
 - **Programming**
Git, Python Matlab, C
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Publications

[1] DeepSense-V2V: A Vehicle-to-Vehicle Multi-Modal Sensing, Localization, and Communications Dataset

J **Morais**, G Charan, N Srinivas, A Alkhateeb,

IEEE Transactions on Vehicular Technology, 2025

[2] Context-Aware Machine Learning-Based Beam Selection With Multi-Panel Devices in the Presence of Self-Blockage

S Rezaie, J **Morais**, A Alkhateeb, P Mogensen, CN Manchón

IEEE Access, 2025

[3] Deep Linearization Mappings for Canonical Correlation Clustering

A Malhotra, ID Schizas, J Morais

IEEE Asilomar, 2024

[4] A Dataset Similarity Evaluation Framework for Wireless Communications and Sensing

J Morais, S Alikhani, A Malhotra, S Hamidi-Rad, A Alkhateeb

IEEE Asilomar, 2024

[5] Localization in digital twin MIMO networks: A case for massive fingerprinting

J Morais, A Alkhateeb

IEEE International Conference on Communications, 2025

[6] DeepSense 6G: A large-scale real-world multi-modal sensing and communication dataset

A Alkhateeb, G Charan, T Osman, A Hredzak, J **Morais**, U Demirhan, N Srinivas

arXiv:2211.09769, 2022

[7] Device-Agnostic Millimeter Wave Beam Selection using Machine Learning

S Rezaie, J **Morais**, A Alkhateeb, CN Manchón

arXiv:2211.12125, 2022

[8] Beam Management Position-aided: From Concept to Real-World Insights

J **Morais**, A Alkhateeb

(not yet published), 2025

- [9] Transfer Learning for Position-aided Beam Prediction: The Right Calibration Method
J Morais, A Alkhateeb
(to be published), 2022
- [10] Position Aided Beam Tracking: Real-World Assessment for Future Beam Prediction
J Morais, A Alkhateeb
IEEE MECOM, 2025
- [11] Position Aided Beam Prediction in the Real World: How Useful GPS Locations Actually Are?
J Morais, A Behboodi, H Pezeshki, A Alkhateeb
IEEE International Conference on Communications, 2023
- [12] Location-and Orientation-aware Millimeter Wave Beam Selection for Multi-Panel Antenna Devices
S Rezaie, **J Morais**, E de Carvalho, A Alkhateeb, CN Manchón
GLOBECOM, 2022
- [13] Multi-modal beam prediction challenge 2022: Towards generalization
G Charan, U Demirhan, **J Morais**, A Behboodi, H Pezeshki, A Alkhateeb
arXiv:2209.07519, 2022
- [14] Parkour Spot ID: Feature Matching in Satellite and Street view images using Deep Learning
J Morais, K Rathi, B Mohan, S Rajesh
arXiv:2201.00377, 2022
- [15] Performance Modelling and Assessment for Social VR Conference Applications in 5G Radio Networks
J Morais, S Braam, R Litjens, S Kizhakkekundil, H van Den Berg
WiMob 2021
- [16] Four Knife-Edge Diffraction with Antenna Gain Model for Generic Blockage Modelling
S Kizhakkekundil, **J Morais**, S Braam, R Litjens
IEEE Wireless Communications Letters, 2021