

# João Morais

Wireless Engineer / EE PhD Student

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## WORK EXPERIENCE

|                                                       |                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ● (Startup in stealth mode), USA<br>2022-now          | <b>Systems and Algorithms Engineering Intern</b><br>Design, simulate, and prototype AI/ML algorithms for millimeter-wave communication. Setup a standard-compliant private 5G network with software defined radios. Study beamforming in O-RAN and 3GPP standards. Deploy and test algorithms in RAN intelligent controllers.       |
| ● TNO, The Netherlands<br>2020-2021                   | <b>R&amp;D Intern in 5G Virtual Reality Lab</b><br>Built a 5G System-level simulator consisting of a model for user head movement during virtual reality meetings, a wideband multi-user scheduler, beam management procedures, and sub-6Ghz and mmWave channel modeling. Result: 2 patents on 5G physical layer and 1 publication. |
| ● Delft University of Technology, Netherlands<br>2019 | <b>Summer Intern – Built Radio Controlled Cars</b><br>Built a fleet of 20 cars packed with sensors (ultrasonic, LiDAR, IMU) and communication capabilities (Wi-Fi and Bluetooth) for platooning course.                                                                                                                             |
| ● JANZ, Portugal<br>2018                              | <b>R&amp;D Intern in Radio Communications Unit</b><br>Performed propagation simulations with LoRa radios in a private network. Tested radio coverage of water meter emitters with field measurements.                                                                                                                               |

## EDUCATION

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|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ● Arizona State University, USA<br>2021-now                | <b>PhD, Electrical and Computer Engineering</b><br>Advised by Prof. Ahmed Alkhateeb. Mentored by Arash Behboodi and Hamed Pezeshki from Qualcomm. Member of IEEE Eta Kappa Nu Electrical and Computer Engineering honor society. Investigating explainable AI in wireless networks. Currently building data pipelines for real-world multi-sensor experimental testbeds. Soon making them standard-compliant. |
| ● Delft University of Technology, Netherlands<br>2019-2020 | <b>Erasmus+ Exchange Program</b><br>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 based on Wi-Fi APs.                                                                                                                                                |
| ● IST, University of Lisbon, Portugal<br>2015-2020         | <b>BSc + MSc, Electrical and Computer Engineering</b><br>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.                                                                                                                              |

## EXPERTISE

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|---------------------------------------|--------------------------------|------------------------------------|--------------------------------|------------------------------------|
| ● Problem Solving<br>Very Experienced | ● Teamwork<br>Very Experienced | ● Creative Thinking<br>Experienced | ● Communication<br>Experienced | ● Programming<br>C, Python, Matlab |
|---------------------------------------|--------------------------------|------------------------------------|--------------------------------|------------------------------------|

## Publications

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**[1]** 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, Nikhil Srinivas

arXiv:2211.09769, 2022

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

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

arXiv:2211.12125 (waiting on IEEE Transactions on Wireless Communications), 2022

**[3]** Position Aided Beam Prediction in the Real World: How Useful GPS Locations Actually Are?

**J Morais**, A Behboodi, H Pezeshki, A Alkhateeb

ICC 2022

**[4]** 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

**[5]** Multi-modal beam prediction challenge 2022: Towards generalization

G Charan, U Demirhan, **J Morais**, A Behboodi, H Pezeshki, A Alkhateeb

arXiv:2209.07519, 2022

**[6]** 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

**[7]** Parkour Spot ID: Feature Matching in Satellite and Street view images using Deep Learning

**J Morais**, K Rath, B Mohan, S Rajesh

arXiv:2201.00377, 2022

**[8]** 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