Davi V. Q. Rodrigues

Address 500 W. University Avenue
El Paso, TX 79968
USA

Phone 806-500-9089
E-mail valeriodequeiroz@icloud.com

EMPLOYMENT

Assistant Professor, Department of Electrical and Computer Engineering, The University of Texas at El Paso, El Paso, Texas, USA, Sept 2023 - present

- Research interests include the design of microwave/millimeter-wave circuits and systems and signal processing algorithms for applications in smart home technology, smart living solutions, healthcare, structural health monitoring, security, autonomous vehicles, and smart robotics

EDUCATION

Ph.D. in Electrical Engineering, Texas Tech University, Lubbock, Texas, USA, May 2023

- Dissertation: Structural Health Monitoring, Smart Living, and Healthcare Applications Using Active and Passive RF Sensing Technologies
- Advisor: Dr. Changzhi Li

M.S. in Electrical & Computer Engineering, Texas Tech University, Lubbock, Texas, USA, 2021

B.S. in Communications Engineering, Military Institute of Engineering, Brazilian Army, Brazil, 2017

PUBLICATIONS

Articles in referred journals

[1] D. Rodriguez, **D. V. Q. Rodrigues**, A. Mishra, M. A. Saed, and C. Li, "Quadrature and Single Channel Low-Cost Monostatic Radar Based on a Novel 2-Port Transceiver Chain," IEEE Transactions on Microwave Theory and Techniques (accepted).

[2] V. G. Rizzi Varela, **D. V. Q. Rodrigues**, L. Zeng, and C. Li, "Multi-Target Physical Activities Monitoring and Classification Using a V-Band FMCW Radar," IEEE Transactions on Instrumentation and Measurement, vol. 72, pp. 1-10, 2023, Art no. 8500910, doi: 10.1109/TIM.2022.3227998.

[3] D. Tang, V. G. Rizzi Varela, **D. V. Q. Rodrigues**, D. Rodriguez, and C. Li, "A Wi-Fi Frequency Band Biomedical Passive Radar Sensor," IEEE Transactions on Microwave Theory and Techniques, 2022, doi: 10.1109/TMTT.2022.3193408.

[4] D. Tang, **D. V. Q. Rodrigues**, M. C. Brown, and C. Li, "Dual Null Detection Points Removal and Time-Domain Sensitivity Analysis of a Self-Injection-Locked Radar for Small Amplitude Motion Sensing," IEEE Transactions on Microwave Theory and Techniques, vol. 70, no. 9, pp. 4263-4272, Sept. 2022, doi: 10.1109/TMTT.2022.3186299.

[5] **D. V. Q. Rodrigues**, D. Zuo and C. Li, "A MODWT-Based Algorithm for the Identification and Removal of Jumps/Short-Term Distortions in Displacement Measurements Used for Structural Health Monitoring," IoT, 2022, https://doi.org/10.3390/iot3010003.

[6] **D. V. Q. Rodrigues** and C. Li, "A Review on Low-Cost Microwave Doppler Radar Systems for Structural Health Monitoring," Sensors, no. 8, pp. 2612, 2021, https://doi.org/10.3390/s21082612.

[7] **D. V. Q. Rodrigues**, D. Zuo and C. Li, "Wind-Induced Displacement Analysis for a Traffic Light Structure Based on a Low-Cost Doppler Radar Array," IEEE Transactions on Instrumentation and Measurement, vol. 70, pp. 1-9, 2021, Art no. 6503909, doi: 10.1109/TIM.2021.3098380.

[8] **D. V. Q. Rodrigues**, D. Zuo, Z. Tang, J. Wang, C. Gu and C. Li, "Adaptive Displacement Calibration Strategies for Field Structural Health Monitoring Based on Doppler Radars," IEEE Transactions on Instrumentation and Measurement, vol. 69, no. 10, pp. 7813-7824, Oct. 2020, doi: 10.1109/TIM.2020.2982233.

[9] **D. V. Q. Rodrigues**, D. Rodriguez, J. Wang and C. Li, "Smaller and With More Bars: A Relay Transceiver for IoT/5G Applications," IEEE Microwave Magazine, vol. 21, no. 1, pp. 96-100, Jan. 2020, doi: 10.1109/MMM.2019.2945151.

Articles in referred conference proceedings

[1] **D. V. Q. Rodrigues** and C. Li, "Tracking Driver's Foot Movements Using mmWave FMCW Radar", in *Proc. IEEE MTT-S Topical Conference on Wireless Sensors and Sensor Networks (WiSNeT)*, 2023 (accepted).

[2] **D. V. Q. Rodrigues**, D. Rodriguez, V. Pugliese, M. Watson and C. Li, "Gas-Liquid Two-Phase Flow Monitoring Using Sub-THz Radar Imaging", in *Proc. IEEE 23rd Wireless and Microwave Technology Conference (WAMICON)*, Melbourne, FL, USA, 2023, pp. 133-136, doi: 10.1109/WAMICON57636.2023.10124898.

[3] **D. V. Q. Rodrigues** and T. Singh, "Radar-Based Detection Utilizing Active-Tag-Enhanced Intelligent Reflective Surfaces for Indoor Scenarios", in *Proc. SPIE Radar Sensor Technology XXVII,* 1253508 (14 June 2023); https://doi.org/10.1117/12.2662926.

[4] **D. V. Q. Rodrigues** and C. Li, "A Microwave Passive Topology Based on Simultaneous Injection-Locking and Injection-Pulling for Passive Indoor Sensing Applications," in *Proc. International Microwave and Antenna Symposium (IMAS)*, Cairo, Egypt, 2023, pp. 107-110, doi: 10.1109/IMAS55807.2023.10066911.

[5] **D. V. Q. Rodrigues**, D. Tang, and C. Li, "A Novel Microwave Architecture for Passive Sensing Applications," in *Proc. IEEE MTT-S Radio and Wireless Symposium (RWS),* 2022, pp. 57-59, doi: 10.1109/RWS53089.2022.9719929.

[6] V. G. R. Varela, **D. V. Q. Rodrigues**, and C. Li, "Separation of Simultaneous Multi-Person Noncontact Physical Activity Signals Using Frequency-Modulated Continuous-Wave Radars," in *Proc. IEEE MTT-S Topical Conference on Wireless Sensors and Sensor Networks (WiSNeT)*, 2022, pp. 5-7, doi: 10.1109/WiSNet53095.2022.9721355.

[7] **D. V. Q. Rodrigues** and C. Li, "RF-Tag-Referenced Structural Displacement Measurements with Multiple moving interferers," in *Proc. IEEE MTT-S Topical Conference on Wireless Sensors and Sensor Networks (WiSNeT)*, 2022, pp. 14-17, doi: 10.1109/WiSNet53095.2022.9721376.

[8] **D. V. Q. Rodrigues**, D. Rodriguez, V. Pugliese, M. Watson and C. Li, "Air Bubble Detection Based on Portable mm-Wave Doppler Radars," in *Proc. IEEE MTT-S International Wireless Symposium (IWS),* 2021, pp. 1-3, doi: 10.1109/IWS52775.2021.9499644.

[9] **D. V. Q. Rodrigues** and C. Li, "Hand Gesture Recognition Using FMCW Radar in Multi-Person Scenario," in *Proc. IEEE MTT-S Topical Conference on Wireless Sensors and Sensor Networks (WiSNeT),* 2021, pp. 50-52, doi: 10.1109/WiSNeT51848.2021.9413794.

[10] **D. V. Q. Rodrigues** and C. Li, "Noncontact Exercise Monitoring in Multi-Person Scenario with Frequency-Modulated Continuous-Wave Radar," in *Proc. IEEE MTT-S International Microwave Biomedical Conference (IMBioC)*, 2020, pp. 1-3, doi: 10.1109/IMBIoC47321.2020.9385031.

[11] **D. V. Q. Rodrigues**, D. Rodriguez, and C. Li, "Liquid Aerosol Detection Based on Sub-THz Portable Doppler Radars," in *Proc. IEEE MTT-S Asia-Pacific Microwave Conference (APMC)*, 2020, pp. 504-506, doi: 10.1109/APMC47863.2020.9331483.

[12] **D. V. Q. Rodrigues**, Z. Tang, J. Wang, D. Zuo and C. Li, "Structural Health Monitoring of a Traffic Signal Support Structure Based on 5.8-GHz Doppler Radar with Median Filter and Revised Circle Fitting," in *Proc. IEEE MTT-S Radio and Wireless Symposium (RWS)*, 2020, pp. 187-190, doi: 10.1109/RWS45077.2020.9050044.

PATENTS

[1] US Patent Application 63/299,942: Microwave Architecture for Passive Sensing Applications, Publication Date: January 15, 2022.

PROFESSIONAL ACADEMIC SERVICE

- **Panelist for IMS Project Connect - IEEE MTT-S International Microwave Symposium** (2023)
- **Member of the Technical Program Committee of the IEEE MTT-S Radio Wireless Week** (2021-present)
- **Member of the Technical Program Committee of the IEEE Asilomar Conference on Signals, Systems, and Computers** (2022-present)
- **Reviewer**: IEEE Transactions on Microwave Theory and Techniques; IEEE Open Journal of Antennas and Propagation; IEEE Microwave and Wireless Technology Letters; IEEE Transactions on Instrumentation and Measurement; IEEE Sensors Journal; IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology; IEEE Transactions on Consumer Electronics; IEEE Geoscience and Remote Sensing Letters; IEEE Transactions on Biomedical Engineering; IEEE Transactions on Human-Machine Systems; Sensors; Remote Sensing; ACM Transactions on Internet of Things; Scientific Data; Scientific Reports

INVITED TALKS

[1] "Noncontact Vital Signs Detection Using a 2.45-GHz Ambient Wireless Sensing System," *Signal Processing and Systems for Radar-Based Vital Sign Monitoring*, 56th Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, November 2, 2022.

[2] "Structural Health Monitoring, Smart Living, and Other Applications Using Active and Passive RF Sensing Technologies," *Uhnderstanding Series*, Uhnder, Inc., Austin, TX, USA, June 2, 2022.

[3] "Structural Health Monitoring & Smart Living Applications Using Radar Technology," *Texas Tech University Graduate Seminar,* Texas Tech University, Lubbock, TX, USA, October 22, 2021.

OTHER APPOINTMENTS

- **Research Assistant**, Department of Electrical & Computer Engineering, Texas Tech University, Lubbock, Texas, USA, Aug 2018 – May 2023
    - Worked on the design of wireless sensors and signal processing algorithms for various radar-based applications, including smart home technology, smart living solutions, healthcare, structural health monitoring, security, and autonomous platforms
    - Nine journal articles and 10 conference papers were published
    - One US patent application was generated
- **mmWave Systems Developer**, Advanced Wireless Technology R&D Group, Office of the CTO, Dell Technologies, Remote-Texas, USA, Aug 2022 – Nov 2022
    - Conducted research on wireless communications and wireless sensing assisted by intelligent reflective surfaces
    - Three US patent applications were generated, and three papers were submitted
- **RF Design Engineering Intern**, Cardiac Rhythm Management Division, Abbott Laboratories, Los Angeles, California, USA, Feb 2022 – Jul 2022
    - Involved with the design of antennas and microwave systems for next-generation implantable medical devices
    - US patent application on various antenna concepts for leadless pacemaker was generated
- **Radar Systems Engineering Intern**, Uhnder, Inc., Austin, Texas, USA, May 2021 – Aug 2021
    - Involved with the design and evaluation of signal processing algorithms for the mitigation of radar interference among digital code modulation (DCM) radars
    - Wrote a report for a US patent application and a conference paper
- **1st Lieutenant of the Engineer Officers' Branch**, Brazilian Army, Rio de Janeiro/Porto Alegre, Brazil, Jan 2017 – Aug 2018
    - Served in the Brazilian Southern Military Command, Rio Grande do Sul, Brazil, as the assistant manager for IT services
    - Instructor on the basic training of ~ 100 new cadets
- **Instructor at Grupo Salta Educacao**, Rio de Janeiro, Brazil, Mar 2013 – Jan 2018
    - Lectured Mathematics and Physics to students for college- and high-school-level nationwide admission exams
- **Student at the Brazilian Naval High School**, Brazilian Navy, Angra dos Reis, Brazil, Jan 2009 – Dec 2011
    - Teacher Assistant of Physics
    - Named Student-Commander of the 1st Company of Students, the third highest leadership position among ~700 students at the military school

HONORS & AWARDS

- PhD Student of the Year, Department of Electrical and Computer Engineering, Texas Tech University, 2023

- Horn Distinguished Professors Graduate Achievement Award, Texas Tech University, 2023
- IEEE MTT-S Tom Brazil Fellowship Award, 2022
- Cadence Diversity in Technology Scholarship, 2022
- IEEE MTT-S IMS High-Sensitivity Motion Sensing Radar Competition 2nd place (Davi V. Q. Rodrigues, Daniel Rodriguez, Prateek Nallabolu), 2021
- Best Student Paper Award – Honorable Mention, IEEE MTT-S International Wireless Symposium (IWS), 2021
- Best Student Paper Award Finalist, IEEE MTT-S Radio Wireless Week (RWW), 2021
- Best Student Paper Award, IEEE MTT-S International Microwave Biomedical Conference (IMBioC), 2020
- Best Paper Award in Antenna Category, IEEE MTT-S Asia-Pacific Microwave Conference (APMC), 2020
- IEEE MTT-S IMS Adaptive Relay Transceiver Competition 1st place (Davi V. Q. Rodrigues, Daniel Rodriguez, Jing Wang), 2019
- IEEE MTT-S IMS High-Sensitivity Motion Sensing Radar Competition 2nd place (Davi V. Q. Rodrigues, Daniel Rodriguez, Jing Wang), 2019
- IEEE MTT-S Project Connect Scholar, 2019
- Silver Medal at the Mathematics Olympiad of the State of Rio de Janeiro, Brazil, 2012
- Brazilian Naval High School Award/Admiral Octavio Antonio Garnier Award/Honorable Merit Award, Brazilian Navy, 2011
    - Ranked 1st/229 students at the end of the three-year course
- Gold and Bronze Medals at the Brazilian Mathematics Olympiad of Public Schools, 2009/2010
    - Around 18 million Brazilian students attempt the first round of this nationwide mathematics contest every year (https://americasquarterly.org/article/why-the-worlds-top-mathematicians-are-coming-to-rio/)
- Silver (2x) and Bronze Medals at the Brazilian Physics Olympiad, 2009/2010/2011
- Class leader at the Brazilian Naval High School, Brazilian Navy, 2009
    - Ranked 1st/~10,000 candidates at the nationwide entrance selection