

Marco Antonio Marques Marinho
Brasília, Brazil

Education

- 2018 HALMSTAD UNIVERSITY / UNIVERSITY OF BRASÍLIA
Doctor of Philosophy in Computer Science / Electrical Engineering, March 2018
- 2013 UNIVERSITY OF BRASÍLIA
Master of Electrical Engineering, September 2013
- 2012 UNIVERSITY OF BRASÍLIA
Communication Networks Engineer, December 2012

Work Experience

Banco do Brasil, Brasília, Brazil

2009-2013, Java Software Developer

Developed software for internal costumers in the legal matters area of the bank.

Research Experience

University of Brasília, Brasília, Brazil

2018-, Researcher

◦Government Data Analysis

Applied signal processing techniques to the data-set of Brazil's government purchases to identify patterns and inconsistencies.

Halmstad University, Halmstad, Sweden

2017-2018, PhD candidate

◦Vehicular Network Localization

Proposed a model based on DOA estimation for localization of vehicles in a vehicular network. Extended the proposed method considering a spherical waveform allowing for better accuracy and more reliable estimation.

◦Array Interpolation

Proposed a modification of the generalized regression neural networks to fit the problem of array interpolation. The proposed method can perform array interpolation in real time, presenting a good trade-off between accuracy and computational load.

◦Cooperative MIMO

Derived the optimal re-synchronization interval with respect to energy consumption and bit error rate. Presented multiple alternatives for synchronization and studied synchronization error propagation.

German Aerospace Center, Munich, Germany

2015-2016, Research Fellow

◦Multidimensional Array Interpolation

Extended the linear array interpolation method to a tensor formulation, allowing it to be applied to arrays with an arbitrary number of dimensions.

◦Array Interpolation

Proposed a modification of the multivariate adaptive regression splines methods to better fit the problem of array interpolation. The proposed method allows interpolation to be applied to arrays with a limited number of elements while maintaining good estimation accuracy.

◦Cooperative MIMO

Proposed a cluster formation method capable of selecting and forming the optimal cluster in terms of cluster size and selected nodes minimizing variance in the individual node energy reserve while maximizing the communication energy efficiency.

University of Brasília, Brasília, Brazil

Jan-Dec 2014, PhD candidate

◦Unscented Transform Array Discretization

Studied the application of the unscented transform to the discretization of an array manifold, achieving the conservation of received signal statistics when transforming from continuous to a discrete domain.

◦Array Interpolation

Proposed a modification of the total least squares algorithm to the linear array interpolation method, allowing for a higher accuracy in the final DOA estimations.

German Aerospace Center, Munich, Germany

Jan-Dec 2013, Master thesis student

◦Array Interpolation

Proposed a linear signal adaptive array interpolation method capable of reduced DOA estimation bias. Derived optimization method for achieving lowest BER possible based on received signal.

◦Cooperative MIMO

Studied the possible application of a distributed MIMO system in wireless sensor networks. Derived the threshold for when to employ MIMO in wireless sensor networks scenarios. Derived control algorithms and routing method for improving wireless sensor network reliability with the aid of autonomous unmanned aerial vehicles.

Research Interests

Array signal processing

Global Navigation Satellite Systems (GNSS)

Sensor Networks

Multiple Input Multiple Output (MIMO) Systems

Research Submissions

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- 2019 “Spherical Wave Array Based Positioning for Vehicular Scenarios”, under review.
- 2019 “On Cooperative MIMO for Wireless Sensor Networks”, under review.

Research Publications

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- 2019 “M-estimator based Chinese Remainder Theorem with few remainders using a Kronecker product based mapping vector,” *Digital Signal Processing*.
- 2018 **“Robust Nonlinear Array Interpolation for Direction of Arrival Estimation of Highly Correlated Signals,”** *Signal Processing*, p. 19-28.
- 2018 “Performance Assessment for Distributed Broadband Radio Localization,” *Asilomar Conference on Signals, Systems, and Computers (2018)*, p. 20-23.
- 2017 “Direction of arrival estimation performance for compact antenna arrays with adjustable size,” *IEEE/MTTS International Microwave Symposium (2017)*, p. 666.
- 2017 **“Antenna Array Based Localization Scheme for Vehicular Networks,”** *IEEE International Conference on Computer and Information Technology (2017)*, p. 142.
- 2016 “Adaptive communication and cooperative MIMO cluster formation for improved lifetime in wireless sensor networks,” *IEEE International Conference on Wireless for Space and Extreme Environments (2016)*, p. 190.
- 2016 “Array interpolation based on multivariate adaptive regression splines,” *IEEE Sensor Array and Multichannel Signal Processing Workshop (2016)*, p. 1.
- 2016 “Multi-hop Cooperative XIXO Transmission Scheme for Delay Tolerant Wireless Sensor Networks,” *ITG Workshop on Smart Antennas (2016)*.
- 2015 “A Practical Implementation of a Cooperative Antenna Array for Wireless Sensor Networks,” *Lecture Notes in Computer Science. 1ed.: Springer International Publishing (2015)*
- 2015 “Multidimensional Array Interpolation Applied to Direction of Arrival Estimation,” *International ITG Workshop on Smart Antennas (2015)*.
- 2014 “Sensor Localization via Diversely Polarized Antennas,” *IEEE International Conference on Distributed Computing in Sensor Systems (2014)*, p. 333.
- 2014 “A signal adaptive array interpolation approach with reduced transformation bias for DOA estimation of highly correlated signals,” *IEEE International Conference on Acoustics, Speech and Signal Processing (2014)*, p. 2272.
- 2014 “Reduced Rank TLS Array Interpolation for DOA Estimation,” *International ITG Workshop on Smart Antennas (2014)*.
- 2014 “Evaluation of Space-Time-Frequency (STF)-Coded MIMO-OFDM Systems in Realistic Channel Models,” *28th International Conference on Advanced Information Networking and Applications Workshops (2014)*, p. 310.

- 2014 “Energy harvesting photovoltaic system to charge a cell phone in indoor environments,” *International Conference on Composite Materials & Renewable Energy Applications (2014)*, p. 1.
- 2014 **“Improved Array Interpolation for Reduced Bias in DOA Estimation for GNSS,” *ION ITM (2014)*.**
- 2013 “Synchronization for Cooperative MIMO in Wireless Sensor Networks,” *Lecture Notes in Computer Science. 1ed.: Springer Berlin Heidelberg (2013)*.
- 2013 “Using cooperative MIMO techniques and UAV relay networks to support connectivity in sparse Wireless Sensor Networks,” *International Conference on Computing, Management and Telecommunications (2013)*, p. 49.
- 2013 “Using MIMO Techniques to Enhance Communication Among Static and Mobile Nodes in Wireless Sensor Networks,” *IEEE 27th International Conference on Advanced Information Networking and Applications (2013)*, p. 500.
- 2013 “Antenna Array Based Positioning Scheme for Unmanned Aerial Vehicles,” *International ITG Workshop on Smart Antennas (2013)*.
- 2013 “Applying Cooperative MIMO Technique in an Adaptive Routing Mechanism for Wireless Sensor Networks,” *IEEE Conference on Wireless Sensor (2013)*, p. 47.
- 2012 “Applying MIMO Techniques to Minimize Energy Consumption for Long Distances Communications in Wireless Sensor Networks,” *Lecture Notes in Computer Science. 1ed.: Springer Berlin Heidelberg (2012)*.
- 2012 “Improved landing radio altimeter for unmanned aerial vehicles based on an antenna array,” *IV International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (2012)*, p. 105.

Honors and Awards

- 2012 Best paper award, *IV International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (2012)*.