

CURRICULUM VITAE OF RAQUEL CRUZ DA CONCEIÇÃO

Telephone number: +351969605474 **email:** rcconceicao@fc.ul.pt

Researcher unique identifiers: ORCID: [0000-0002-0025-863X](https://orcid.org/0000-0002-0025-863X); ResearcherID: [M-3480-2013](https://www.researcherid.com/rid/M-3480-2013); Scopus: [Author ID 26639062200](https://orcid.org/AuthorID/26639062200); Ciência ID: [2B14-F6B6-4613](https://ciencia.id/2B14-F6B6-4613)

URL for website: www.linkedin.com/in/rqlcdc; <http://scholar.google.ch/citations?user=Hib48fcAAAAJ&hl=en>

• SUMMARY

Award winning researcher and professor with a significant record of peer-reviewed publications and funded European grants. First doctorate researcher in Portugal in the area of microwave medical imaging, who was the youngest COST Action chair in this area of research: COST Action TD1301. I am a tenure-track Assistant Professor at the University of Lisbon, Portugal, and also the coordinator of the Institute of Biophysics and Biomedical Engineering. My main area of research is the development of microwave imaging techniques to detect and classify breast cancer. I have other research interests which cover machine learning modelling techniques and more general biomedical engineering and applied electronic engineering topics. I am the author of 30 journal papers, 52 conference proceedings and editor/author of 3 books. I have supervised (past and ongoing) the work of 7 PhD students and 28 Masters students, and 24 undergraduate scientific projects, plus 4 other research projects.

• EDUCATION

- 2023 Habilitation (“Agregação”) in Biomedical Engineering and Biophysics – Faculdade de Ciências, Universidade de Lisboa, FCUL, Portugal
- 2011 PhD in Electrical & Electronic Engineering – Electrical & Electronic Engineering, College of Engineering and Informatics, National University of Ireland – Galway (NUIG), Ireland
- 2007 BSc+MSc in Biomedical Engineering – Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, FCTUNL, Portugal

• CURRENT POSITIONS

- 2016 – Assistant Professor with Habilitation (“Agregação”) – Faculdade de Ciências, Universidade de Lisboa (FCUL), Portugal: lecturer, supervisor of 28 MSc and 7 PhD students, coordinator of BSc+MSc and MSc degree in Biomedical Engineering and Biophysics between 2019-2022 and 2021-2022, respectively.
- 2022 – Coordinator of Institute of Biophysics and Biomedical Engineering – Faculdade de Ciências, Universidade de Lisboa (FCUL).

PREVIOUS ACADEMIC POSITIONS

- 2013 – 2016 Invited Assistant Professor – FCUL, Portugal: lecturer, and MSc and PhD students’ supervisor
- 2016 Post-Doctoral Computer Scientist – Department of Oncology, University of Oxford, UK
- 2014 – 2016 Post-Doctoral Researcher – Institute of Biomedical Engineering, University of Oxford, UK
- 2012 – 2015 Post-Doctoral Researcher/Investigator – Instituto de Biofísica e Engenharia Biomédica (IBEB), FCUL, Portugal

• FELLOWSHIPS & GRANTS

- 2018 – 2022 Innovative Training Network, Marie Skłodowska-Curie Action H2020 (Beneficiary), 764479
- 2013 – 2015 Intra-European Fellowship, Marie Curie 7th FP, 301269
- 2013 – 2017 Chair of COST Action, “Development of a Collaborative Network to Accelerate Technological, Clinical and Commercialisation Progress in the Area of Medical Microwave Imaging” (TD1301)
- 2012 Post-doctoral scholarship, funded by Fundação para a Ciência e a Tecnologia, SFRH/BPD/79735/2011
- 2007 – 2010 PhD scholarship, Science Foundation Ireland, “The Development of Ultra Wide Band (UWB) Scanning Techniques for Early Detection of Cancer”, 07/RFP/ENEF420
- 2005 – 2006 Erasmus scholarship, Universidade Nova de Lisboa, Portugal

• PRIZES AND AWARDS (SELECTED)

- 2018 Young Scientist Award 2018, awarded at the 2nd URSI AT-RASC, Gran Canaria, Spain
- 2017 Young Scientist Award 2017, awarded at the 32nd URSI GASS, Montreal, Canada
- 2014 Young Scientist Award 2014, awarded at the 31st URSI GASS, Beijing, China
- 2013 Prize ANACOM-URSI Portugal for the best scientific work in the area of radioelectricity, Portugal
- 2013 NSS/MIC/RTSD 2013 Trainee Award for IEEE Medical Imaging Conference, South Korea
- 2013 Best paper award at the 8th International Conference on Systems (ICONS), Spain

2012 NSS/MIC/RTSD 2012 Trainee Award for IEEE Medical Imaging Conference, USA

• COMMISSIONS OF TRUST (SELECTED)

2020 – ongoing Topic Editor for the journal Sensors

2019-2022 Evaluator for H2020-FET-OPEN & Evaluator for H2020-MSCA-IF

2018 & 2019 FCT National Evaluation Panel for PhDs in the Bioengineering and Biotechnology Panel

2018 Foreign Expert for Czech Technical University Prague, accreditation of Biomedical Engineering programme

2017 & 2019 Evaluator for progress and final review of H2020-RIA project DESIREE

2017 European Commission project reviewer for Curam, Ireland

2013 – ongoing Associate Editor for the journal Medical Physics

2013 – ongoing Scientific Evaluator for: COST Actions

2012 – ongoing Co-PI for the research area “Multimodal Imaging Techniques” at IBEB, FCUL, Portugal

• MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2023 – Vice-president of the URSI Portuguese Committee for Commission K "Electromagnetics in Biology and Medicine"

2022 – Member of MTTs TC-28 Biological Effects and Medical Applications Committee

2017 – URSI Individual Member (MURSI), member M1730515688 (appointment for life)

2016 – The European Association on Antennas and Propagation (EurAAP) Member, member 2016/2324

2013 – Marie Curie Alumni Association (MCAA)

• PUBLICATION SUMMARY

Total publications	Publications as 1 st and senior author	h-Index	Number of citations	Source of citation data	
		17	1042	Google Scholar	
		15	571	Scopus	
90	26+34				
Research Articles	Reviews	Books	Conference Publications	Years since PhD	Years since first Academic Employment
32	2	3	56	12	11

Journal publications:

1. “Dielectric characterization of healthy human teeth from 0.5 GHz to 18 GHz with an open-ended coaxial probe”, Sensors, 2023
2. “Biometric Recognition: a Systematic Review on Electrocardiogram Data Acquisition Methods”, Sensors, 2023
3. “Evaluating the Performance of Algorithms in Axillary Microwave Imaging towards Improved Breast Cancer Staging”, Sensors, 2023
4. “Experimental Assessment of Axillary Lymph Node Microwave Tomography using Anthropomorphic Phantoms”, IEEE JERM, 2023
5. “Modelling Level I Axillary Lymph Nodes Depth for Diagnostic Imaging Technologies”, Physica Medica, 2022
6. “Initial Study Using Electrocardiogram for Authentication and Identification”, Sensors, 2022
7. “Experimental Evaluation of an Axillary Microwave Imaging System to Aid Breast Cancer Staging”, IEEE JERM, 2022
8. “Development of 3D MRI-based anatomically realistic numerical models of breast tissues and tumours for Microwave Imaging diagnosis”, Sensors, 2021.
9. “Application of Machine Learning to Predict Dielectric Properties of In Vivo Biological Tissue”, Sensors, 2021
10. “Development of MRI-based Axillary Numerical Models and Estimation of Axillary Lymph Node Dielectric Properties for Microwave Imaging”, MedPhys, 2021
11. “Study of Freezing and Defrosting Effects on Complex Permittivity of Biological Tissues”, IEEE AWPL, 2021
12. “Evaluation of Refraction Effects in Dry Medical Microwave Imaging Setups”, IEEE AWPL, 2021
13. “Development of an Anthropomorphic Phantom of the Axillary Region for Microwave Imaging Assessment”, Sensors, 2020
14. “Characterisation of Ex Vivo Liver Thermal Properties for Electromagnetic-Based Hyperthermic Therapies”, Sensors, 2020
15. “Development of a 3D Anthropomorphic Phantom Generator for Microwave Imaging Applications of the Head and Neck Region”, Sensors, 2020
16. “Classification of breast tumor models with a prototype microwave imaging system”, MedPhys, 2020
17. “Optimal b-values for Diffusion Kurtosis Imaging in Invasive Ductal Carcinoma versus Ductal Carcinoma In Situ Breast Lesions”, Australasian Physical & Engineering Sciences in Medicine, 2019

18. "Gamma Distribution Model in the Evaluation of Breast Cancer through Diffusion Weighted MRI: a Preliminary Study", JMRI, 2019
19. "Diagnosing Breast Cancer with Microwave Technology: remaining challenges and potential solutions with machine learning", Diagnostics, 2018
20. "Development of Clinically-Informed 3D Tumor Models for Microwave Imaging Applications", IEEE AWPL, 2015
21. "Other applications of medical microwaves – Breast tumour classification", New Horizons in Translational Medicine, 2015
22. "Compressive-Sampling for Time Critical Microwave Imaging Applications", IET HTL, 2014
23. "Optimization of Convergent Collimators for Pixelated SPECT Systems", MedPhys, 2013
24. "Numerical Modelling for Ultra Wideband Radar Breast Cancer Detection and Classification", PIERB, 2011.
25. "Evolving Spiking Neural Network Topologies for Breast Cancer Classification in a Dielectrically Heterogeneous Breast", PIERL, 2011
26. "The Effects of Compression on Ultra Wideband Radar Signals", PIER, 2011
27. "Spiking Neural Networks for Breast Cancer Classification in a Dielectrically Heterogeneous Breast", PIER, 2011
28. "Effects of Dielectric Heterogeneity in the Performance of Breast Tumour Classifiers", PIERM, 2011
29. "Evaluation of Features and Classifiers for Classification of Early-Stage Breast Cancer", JEMWA, 2011
30. "Spiking Neural Networks for Breast Cancer Classification Using Radar Target Signatures", PIER C, 2010
31. "Support Vector Machines for the Classification of Early-Stage Breast Cancer Based on Radar Target Signatures", PIER B, 2010
32. "Investigation of Classifiers for Early-Stage Breast Cancer Based on Radar Target Signatures", PIER, 2010
33. "Comparison of Planar and Circular Antenna Configurations for Breast Cancer Detection Using Microwave Imaging", PIER, 2009
34. "FDTD Modeling of the Breast: A Review", PIER B, 2009

Conference publications:

1. "Repository of Anthropomorphic Models of the Breast Including Normal Tissues, and Benign and Malignant Tumors for Microwave Imaging Research", EuCAP 2023 (accepted)
2. "Validation of Dielectric Properties Estimation from Magnetic Resonance Images to Accelerate Medical Microwave Applications", EuCAP 2023 (accepted)
3. "Harmonisation of measurement method and reporting method of dielectric properties of tissues", EuCAP 2023 (accepted)
4. Development of mechanically and dielectrically realistic breast models for microwave therapy and healing simulations", EuCAP 2023 (accepted)
5. Experimental Assessment of the Effects of Increasing Illumination Angles to Maximise Useful Information in Axillary Microwave Tomography, IEEE CAMA, 2022
6. Initial observations regarding the measurement of dielectric properties of human teeth, 3rd URSI AT-AP-RASC, 2022
7. Preliminary Development of Anatomically Realistic Breast Tumor Models for Microwave Imaging, EuCAP 2022
8. Target Selection in Multistatic Microwave Breast Imaging Setup Using Dielectric Lens, EuCAP, 2022
9. Effect of Varying Prior Information in Axillary 2D Microwave Tomography", EuCAP, 2022
10. Extracting Dielectric Properties for MRI-based Phantoms for Axillary Microwave Imaging Device, ICHO, 2021
11. Differentiation of brain stroke type by using microwave-based machine learning classification, ICEAA-IEEE APWC, 2021
12. Prostate Index-Lesion Segmentation Using U-NET: Impact of T2w and ADC, ISMRM & SMRT, 2021
13. Optimizing T2 Mapping of Knee Cartilage with Dictionary-based Methods, ISMRM Iberian Chapter Annual Meeting, 2021
14. Comparison of T1-maps and Late Gadolinium Enhancement in the Detection of Myocardial Fibrosis in Hypertrophic Cardiomyopathy, ISMRM Iberian Chapter Annual Meeting, 2021
15. Optimization of Artefact Removal Algorithms for Microwave Imaging of the Axillary Region using Experimental Prototype Signals, EuCAP, 2021
16. From image segmentation to 3D-printing: challenges in the development of a medical-scan derived phantom of the axillary region, EuCAP, 2021
17. Study of the Refraction Effects in Microwave Breast Imaging using a Dry Setup, IEEE EMBC, 2020
18. Extracting Dielectric Properties for MRI-based Phantoms for Axillary Microwave Imaging Device, EuCAP, 2020
19. Head and Neck Numerical Phantom Development for Cervical Lymph Node Microwave Imaging, EuCAP, 2020
20. Development of a Transmission-Based Open-Ended Coaxial-Probe Suitable for Axillary Lymph Node Dielectric Measurements, EuCAP, 2020
21. Thermal properties of ex vivo biological tissue at room and body temperature, EuCAP, 2020
22. Feasibility study of focal lens for multistatic microwave breast imaging, ICECOM, 2019
23. Development of Axillary Region Models based on MRI Segmented Data to Aid Breast Cancer Staging, 1st EMF-Med World Conference on Biomedical Applications of Electromagnetic Fields, 2018
24. Webcam-based Distance and Surface Estimation System for Microwave Imaging, 2018 IEEE AP-USNC-URSI, 2018
25. Extracting Features from Multistatic Signals in a Radar Microwave Imaging System for Breast Cancer Detection, URSI AT-RASC, 2018

26. *Support Vector Machines to Aid Breast Cancer Diagnosis Using a Microwave Radar Prototype*, URSI GASS, 2017
27. *Deep learning for tumour classification in homogeneous breast tissue in medical microwave imaging*, IEEE EUROCON, 2017
28. *Digital Analysis of Tumour Microarchitecture as an Independent Prognostic Tool in Breast Cancer*, USCAP, 2017
29. *Overview of Microwave Medical Applications in Europe Since the Beginning of the COST Action TD1301 – MiMed*, EuCAP, 2017
30. *Diffusion Kurtosis Imaging model – Which should be the higher b-value?*, ISMRM, 2016
31. *Initial Study for the Investigation of Breast Tumour Response with Classification Algorithms Using a Microwave Radar Prototype*, EuCAP, 2016
32. *Quantification Models for Breast Tumors ROC Curve Analysis*, Annual ESMRMB Meeting, 2015
33. *Microwave Imaging of the Breast: Investigating Tumour Response with Classification*, PIERS, 2015
34. *Combined Breast Microwave Imaging and Diagnosis System*, PIERS, 2015
35. *Spectral Filtering in Phase Delay Beamforming for Multistatic UWB Breast Cancer Imaging*, EuCAP, 2015
36. *Initial Study for Detection of Multiple Lymph Nodes in the Axillary Region Using Microwave Imaging*, EuCAP, 2015
37. *Contribution of diffusion models in Diffusion-Weighted Magnetic Resonance Imaging (DWI) for improved breast tumor characterization*, ASPIC, 2014
38. *SVM-based Classification of Breast Tumour Phantoms Using a UWB Radar Prototype System*, URSI GASS, 2014
39. *Initial Study with Microwave Imaging of the Axilla to Aid Breast Cancer Diagnosis*, IEEE APS-URSI, 2014
40. *Avoiding Unnecessary Breast Biopsies: Clinically-Informed 3D Breast Tumour Models for Microwave Imaging Applications*, IEEE APS-URSI, 2014
41. *Development of Anatomically and Dielectrically Accurate Breast Phantoms for Microwave Breast Imaging Applications*, SPIE DSS 2014
42. *Development of Axilla Phantoms to Aid Breast Cancer Staging via Sentinel Lymph Node Detection*, EuCAP, 2014
43. *Image Processing Methods for PET/MR Multi-Modality Imaging: Initial Study Regarding Binding of MR images*, IEEE NSS-MIC, 2013
44. *Initial classification of breast tumour phantoms using a UWB radar prototype*, ICEAA, 2013
45. *Imaging and classification of breast cancer with multimodal PEM-UWB techniques*, ICEAA, 2013
46. *Bladder-State Monitoring Using Ultra Wideband Radar*, EuCAP, 2013
47. *Novel Multimodal PEM-UWB Approach for Breast Cancer Detection: Initial Study for Tumour Detection and Consequent Classification*, EuCAP, 2013
48. *Classification and Monitoring of Early Stage Breast Cancer Using Ultra Wideband Radar*, ICONS-IARIA, 2013
49. *A comparison of MapReduce and Parallel Database Management Systems*, ICONS-IARIA, 2013
50. *Breast Tumor Differentiation Through Diffusional Kurtosis Imaging (DKI) in Magnetic Resonance Imaging*, A One Day Symposium with Carlos Caldas sponsored by EACR, 2012
51. *Development of Breast and Tumour Models for Simulation of Novel Multimodal PEM-UWB Technique for Detection and Classification of Breast Tumours*, IEEE NSS-MIC, 2012
52. *Initial Analysis of Novel Multimodal PEM-UWB Technique for Breast Cancer Detection: Localization of Cancer in Homogeneous Model of the Breast*, International Symposium Applied Bioimaging Bridging Development Application, 2012
53. *Tumor Classification Using Radar Target Signatures*, PIERS, 2010
54. *Antenna Configurations for Ultra Wide Band Radar Detection of Breast Cancer*, SPIE BIOS West, 2009
55. *Classification of Suspicious Regions within Ultrawideband Radar Images of the Breast*, IET ISSC, 2008
56. *Statistical Analysis of the Motility of Nano-Objects Propelled by Molecular Motors*, SPIE BIOS West, 2008

Books:

1. *Electromagnetic Imaging for a Novel Generation of Medical Devices: Fundamental Issues, Methodological Challenges and Practical Implementation* (author), Springer, 2023.
2. *Electromagnetic Technologies for Medical Diagnostics: Fundamental Issues, Clinical Applications and Perspectives* (author), MDPI, 2019.
3. *Emerging Electromagnetic Technologies for Brain Diseases Diagnostics and Monitoring* (editor), Springer, 2018.
4. *An Introduction to Microwave Imaging for Breast Cancer Detection* (editor and author), Springer, 2016.