MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2025

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

NOVA Medical School – Universidade NOVA de Lisboa

RESEARCH GROUP AND URL

Data Science and AI Lab for Health
https://www.chrc.pt/pt/chrc/pessoas/jorge-mendes

SUPERVISOR (NAME AND E-MAIL)

Jorge M. Mendes (jorge.mendes@nms.unl.pt); Sérgio Laranjo (sergio.laranjo@nms.unl.pt)

SHORT CV OF THE SUPERVISOR

Jorge M. Mendes is currently an Associate Professor of Statistics and Data Science at NOVA Medical School, NOVA University Lisbon. He is deeply invested in advancing quantitative methods across various domains, including biostatistics, environmental statistics, mathematical epidemiology, and data science for life sciences. His research interests also span survey methodology and quantitative approaches to social sciences.
He holds a bachelor's degree in Statistics and Information Management from NOVA University of Lisbon, an MSc in Probability and Statistics and a PhD in Statistics and Operations Research from the University of Lisbon. Over his career, he has contributed to national and international research projects, particularly as a member of NOVA's Comprehensive Health Research Centre (CHRC) and formerly of the Management Information Centre (MagIC) at NOVA Information Management School (NOVA IMS).
Before his current role, he led the School of Management and the Bachelor's in Information Management at NOVA Cairo at The Knowledge Hub Universities (TKH) in Cairo, Egypt. He previously coordinated several academic programs, including the Master's in Statistics and Information Management at NOVA IMS.
He is an active researcher and author, regularly publishing in scientific journals and serving as a peer reviewer. His dedication to education extends to mentoring MSc and PhD students while frequently acting as an external examiner for graduate programs at other institutions. Passionate about fostering future professionals and researchers, he thrives on connecting data science, statistics, and public health to address global challenges in health and life sciences.

Sérgio Laranjo is a Medical Doctor (Pediatric Cardiologist and Arrhythmologist) with a PhD in Medical Physiology (University of Lisbon), and a postgraduate (Diploma of Advanced Studies in Cardiac Rhythm Management) from the Maastricht University.
He is an attending Pediatric Cardiologist at the Santa Marta Hospital, Centro Hospitalar e Universitário de Lisboa Central. He is also an Assistant Professor of Physiology at the Lisbon School of Medicine.
His current research focuses on unraveling the mechanisms of cardiac arrhythmias, through novel computational electrophysiology techniques and AI; improving patient care using digital health (smartphone applications, wearable and wireless devices), and strategies for primary and secondary prevention of chronic conditions.

5 SELECTED PUBLICATIONS

- Agharafeie, R.; Ramos, J.R.C.; Mendes, J.M.; Oliveira, R. From Shallow to Deep Bioprocess Hybrid Modeling: Advances and Future Perspectives. Fermentation 2023, 9, 922.

- Rita Flores, Ana C. Fradinho, Rita Serras Pereira, Jorge M. Mendes, Miguel C. Seabra, Sandra Tenreiro, Ângela Carneiro; Identifying Imaging Predictors of Intermediate Age-Related Macular Degeneration Progression. Trans. Vis. Sci. Tech. 2023;12(7):22. https://doi.org/10.1167/tvst.12.7.22.

- Mendes JM, Barbar A., Refaie M. Synthetic data generation: a privacy preserving approach to accelerate rare disease research. Front. Digit. Health, 2025, 7:1563991. doi: 10.3389/fdgth.2025.1563991

- M. Mahmudul Hasan, M. Nahidul Islam, N. Sulaiman, M. Mahfuj Hossain and J. M. Mendes, "Real-Time EEG Signal Analysis for Microsleep Detection: Hyper-Opt-ANN as a Key Solution," in IEEE Access, vol. 13, pp. 66354-66372, 2025, doi: 10.1109/ACCESS.2025.3559619.

- Mendes, J.M., Coelho, P.S. The effect of non-pharmaceutical interventions on COVID-19 outcomes: A heterogeneous age-related generalisation of the SEIR model, Infectious Disease Modelling, Volume 8, Issue 3, 2023, Pages 742-768, ISSN 2468-0427, https://doi.org/10.1016/j.idm.2023.05.009.

- Brás, P.G., Cunha, P.S., Timóteo, A.T. et al. Evaluation of left atrial strain imaging and integrated backscatter as predictors of recurrence in patients with paroxysmal, persistent, and long-standing persistent atrial fibrillation undergoing catheter ablation. J Interv Card Electrophysiol 67, 479–492 (2024). https://doi.org/10.1007/s10840-023-01602-z

- Silva Cunha P, Laranjo S, Monteiro S, Portugal G, Guerra C, Rocha AC, Pereira M, Ferreira RC, Heijman J and Oliveira MM (2024) The impact of atrial voltage and conduction velocity phenotypes on atrial fibrillation recurrence. Front. Cardiovasc. Med. 1:1427841. doi: 10.3389/fcvm.2024.1427841

- Laranjo, S., Fonseca, H., Felix, A. C., Gourine, A. V., Pinto, F. F., Oliveira, M., & Rocha, I. (2025). Haemodynamic Patterns in Reflex Syncope: Insights from Head-Up Tilt Tests in Adults and Children. Journal of Clinical Medicine, 14(6), 1874. https://doi.org/10.3390/jcm14061874

- Melo X, Lopes A, Coelho R, Simão B, Oliveira I, Marôco JL, et al. (2025) Acute effects of commercial group exercise classes on arterial stiffness and cardiovagal modulation in healthy young and middle-aged adults: A crossover randomized trial. PLoS ONE 20(3): e0319130. https://doi.org/10.1371/journal.pone.0319130

- Silva Cunha, P., Laranjo, S., Monteiro, S., Almeida, I. G., Mendonça, T., Fontes, I., Ferreira, R. C., Almeida, A. G., Didenko, M., & Oliveira, M. M. (2024). Left Atrial Wall Thickness Estimated by Cardiac CT: Implications for Catheter Ablation of Atrial Fibrillation. Journal of Clinical Medicine, 13(18), 5379. https://doi.org/10.3390/jcm13185379

PROJECT TITLE AND SHORT DESCRIPTION

CARDIOTWINcare

Cardiovascular diseases, particularly heart failure, remain a major global health burden. Despite increasing access to rich data from EHRs, imaging, wearables, and molecular diagnostics, current care models often fail to integrate these multimodal sources effectively. AI and digital twin technologies offer promising avenues to simulate disease progression and optimise therapy, but their adoption is hindered by fragmented data systems, lack of interoperability, and limited clinical validation. Addressing these gaps could enable dynamic, personalised treatment strategies grounded in real-time patient data.

This project aims to develop and validate a digital twin platform for heart failure and cardiac resynchronisation therapy. It will integrate multimodal data using explainable AI, simulate treatment responses, and ensure seamless interoperability with EHR systems through established standards like HL7 FHIR. The expected outcomes include a clinical decision support system embedded into workflows, improved prediction of therapy response, and enhanced understanding of disease phenotypes, contributing to precision cardiovascular care.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST*

Life Sciences (LIF)