

## NOVA IMS Expertise offer

NOVA IMS is a partner seeking the consortium for the following open calls:

- HORIZON-HLTH-2023-TOOL-05-03: Integrated, multi-scale computational models of patient patho-physiology ('virtual twins') for personalised disease management
- HORIZON-HLTH-2023-TOOL-05-04: Better integration and use of health-related real-world and research data, including genomics, for improved clinical outcomes
- HORIZON-HLTH-2023-TOOL-05-05: Harnessing the potential of real-time data analysis and secure Point-of-Care computing for the benefit of person-centred health and care delivery
- HORIZON-HLTH-2023-DISEASE-03-07: Relationship between infections and non communicable diseases

We can contribute with the following tasks:

- Advance the state of the art in multi-scale modelling by employing diverse modelling methodologies (such as artificial intelligence) for modelling the healthy state, disease onset, progression, treatment and recovery;
- Designing and implementing prediction algorithms for treatment outcomes, based on artificial intelligence and machine learning;
- Providing clinicians with real-time imaging, data analysis and interactive visual presentation for understanding and diagnosing diseases, facilitating risk assessment, prevention, and carrying out medical interventions with improved patient safety;
- Integration of health data from multiple sources by linking real-world and clinical research data.

### Core research team



**Leonardo Vanneschi** - Full Professor, NOVA Information Management School (NOVA IMS)

 [lvanneschi@novaims.unl.pt](mailto:lvanneschi@novaims.unl.pt)

 <https://orcid.org/0000-0003-4732-3328>

Leonardo Vanneschi's main research interests involve Machine Learning, Data Science, Complex Systems, and in particular Evolutionary Computation. The latter covers several different fields among which **computational biology**, **image processing**, **personalized medicine**, engineering, logistics, economics and marketing. His work has been consistently recognized and appreciated by the international community from 2000 to nowadays. In 2015, he was honoured with the Award for Outstanding Contributions to Evolutionary Computation in Europe, in the context of EvoStar, the leading European Event on Bio-Inspired Computation. In 2021, he was **included in the list of the 2% of best researchers in the world**, according to a study conducted by Stanford University.



Cofinanciado por:





**Mauro Castelli** – Associate Professor, NOVA Information Management School (NOVA IMS)

 [mcastelli@novaims.unl.pt](mailto:mcastelli@novaims.unl.pt)

 <https://orcid.org/0000-0002-8793-1451>

Mauro Castelli's main research interests are focused on the study of machine learning methods that can be used to take advantage of the vast amount of data that is produced nowadays. In particular, the research focuses on the development, implementation, and application of computational intelligence systems for addressing complex real-world problems in different domains. In particular, in the health sector, his areas of work include geometric semantic genetic programming, Artificial Neural Networks, Genetic Programming, Semantic Learning Machine, Computer Vision and Image Classification. In 2021, he was **included in the list of the 2% of best researchers in the world**, according to a study conducted by Stanford University.

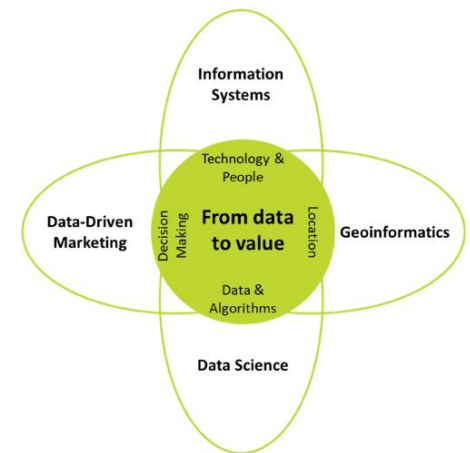
#### **Research projects in competitive research funding (in the topic):**

- [BINDER: Improving Bio-Inspired Deep Learning for Radiomics](#)  
BINDER project contributed to the development of faster, more objective and more robust Radiomics analysis of breast and rectal cancer, using existing and novel Machine Learning (ML) and Deep Learning (DL) methods. It extracted a large number of informative features from a standard of care medical images and analyzed them for improving the diagnosis or better understanding of the severity of the disease and thus decision-making regarding therapeutics. Coordinator: Professor Leonardo Vanneschi.
- [GADgET - Online Gambling Addiction Detection](#)  
this project proposes an AI (Artificial Intelligence)-based tool that could capitalize on the vast amount of data collected every day and analyze online user behaviour to model and detect the behaviours associated with addicted gamblers. Coordinator: Professor Mauro Castelli.
- [PREDICT – Personalized therapy for rheumatic diseases via machine learning](#)  
PREDICT project developed machine learning techniques to address the problems emerging from electronic medical records mining, applied in therapy selection of rheumatic diseases, where two big databases collected by the Portuguese Society of Rheumatology will be available. The project contributed to establishing public health strategies that enhanced treatment via tailored therapies, decreasing the overall costs and improving the quality of life of the patients. Participant: Professor Mauro Castelli.

#### **More about NOVA IMS research**

NOVA IMS is a reference institution in the area of data science, with internationally recognized professors appearing in the 2022 top 2% and top 1% Scientists List provided by Stanford University.

We are interested in studying information and the interaction of humans and organizations with information, focused on using the information to develop individuals, and also improve organizations and society, in general. Our contributions lie in finding ways to use information management and data science to improve productivity and sustainability through more informed data-driven decisions and fact-based decision-making.



NOVA IMS research is framed in four main research streams:

- In **Information Systems**, the emphasis is on understanding, at the individual and organizational level, what are the key drivers for the diffusion, adoption, and success of information technology artefacts;
- In the context of **Data Science**, we look to continue to work on supervised learning algorithms both through the application of evolutionary strategies and data generation algorithms for imbalanced learning. We also emphasize geospatial applications, mainly in the context of smart cities.
- In **Geoinformatics**, we are interested in contributing to the development of smart and open cities. Our work is centred on creating the tools and methods that allow for a more data-driven approach to city management as a way to promote a sustainable, safe and livable environment for their ever-increasing populations;
- Finally, in **Data-Driven Marketing**, we have a twofold interest: a) applying theories and tools to have a better understanding of human judgment and decision-making; b) understanding consumer processes in digital environments and underlying neural mechanisms for information processing and decision-making.

Our research team is composed of more than 80 senior and junior professors and researchers. Additionally, the research team at NOVA IMS has extensive experience in research projects, currently with over 40 national and international ongoing projects, 19 of them funded by the European Commission.

#### Examples of other ongoing Horizon Europe projects

- [COMMUNITAS](#) - Bound to accelerate the roll-out and expansion of Energy Communities and empower consumers as fullyfledged energy market players
- [PAFSE](#) - Partnerships for Science Education
- [DE-RISK](#) the adoption of Local Flexibility Markets to unlock the safe and reliable mass deployment of Renewable Energy Systems
- [TwinAIR](#) - Digital Twins Enabled Indoor Air Quality Management for Healthy Living
- FARCLIMATE - Moving ForwARd to achieving CLIMATE-resilient and sustainable European regional economic system

**Website:** <https://magic.novaims.unl.pt/>

**Research Management and Development contact:** Cristina Oliveira – [magic@novaims.unl.pt](mailto:magic@novaims.unl.pt)