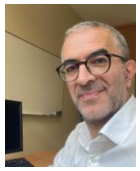
CENTRO DE MATEMÁTICA UNIVERSIDADE DO PORTO

Fundação para a Ciência e a Tecnologia

CMUP ANNUAL MEETING

9 February 2026 **Room: FC1 0.31**

Hour	Speaker	Title and abstract
9:30—10:15	**Flora Ferreira (FEP, CMUP)** 	**Topological Feature Extraction from Time Series: Gait Applications** Topological data analysis (TDA) provides geometric and topological tools for extracting shape based features from time series. In this talk, I outline a pipeline that employs persistent homology and related descriptors to characterize temporal structure. I then present recent studies in which topological features were integrated with machine learning classifiers using gait time series data.
10:20—11:10	**Rui Ferreira (FCUP, CMUP)** 	**Mittag-Leffler functions in Fractional Calculus** We make a light presentation of our most recent findings on the Mittag-Leffler function, or its generalizations, and their connections with fractional differential/difference equations.
	Coffee-Break	

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14:30—15:20	**José Machado (Universidade do Minho, Algoritmi, LASI)** 	**LASI: A National Hub for Trustworthy and Sovereign Artificial Intelligence** The Intelligent Systems Associate Laboratory (LASI) is a non-profit private research association with autonomous governance and strategic management, dedicated to advancing state-of-the-art knowledge in Intelligent Systems (IS) to support an innovative, ethical, and sustainable societal transformation. LASI's mission is to bridge cutting-edge research with real-world impact, enabling intelligent systems to execute concrete tasks, enhance products, services, and processes, and foster new business models across multiple sectors. LASI structures its research around five interdisciplinary thematic lines: (i) Innovative and Sustainable Industries with a strong focus on Industry 5.0; (ii) Smart Cities, Mobility, and Energy; (iii) Health and Well-being; (iv) Infrastructures and a Highly Connected Society; and (v) Public Administration and Governance. These lines address key societal challenges by improving productivity, efficiency, quality, inclusiveness, and sustainability, while empowering human resources and increasing user and citizen satisfaction. With 13 R&D units, more than 534 senior researchers, over 700 PhD candidates—including a significant proportion of international researchers—and a portfolio exceeding 290 funded projects representing more than 150 million euros, LASI demonstrates a strong capacity to attract talent, funding, and strategic partnerships at national and international levels. Its activities are fully aligned with national and European public policies, ethical guidelines for trustworthy AI, and long-term societal priorities. In response to the global shift towards Generative Artificial Intelligence, LASI positions itself at the forefront of research on Large Language Models (LLMs), multimodal AI, explainable AI, and domain-specific intelligent systems. In this context, LASI plays an important role in the AMALIA initiative, a sovereign Portuguese large language model designed to ensure AI autonomy, linguistic and cultural alignment, and compliance with European legal and ethical frameworks. Through this vision, LASI aims to become the leading Portuguese Associate Laboratory exclusively focused on AI and its applications, contributing decisively to Portugal's digital sovereignty and sustainable development.
	Coffee-Break	
15:45—16:30	**André Marçal (FCUP, CMUP)** 	**Image Processing, Mathematics, Art - Gerhard Richter's 1024 Colours** The interdisciplinary context of the work, related to Image Processing, Mathematics and Art, is initially addressed. A brief description of colour models is then presented, followed by the main case study, entitled "Gerhard Richter's 1024 Colours - some interesting permutations".

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