Expression of Interest & Capabilities for Horizon Europe Calls: HORIZON-CL3-2025-01-INFRA-01 & HORIZON-CL3-2025-01-INFRA-02

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As part of NOVA University Lisbon—ranked among the top young universities in Europe—NOVA Information Management School (NOVA IMS) is a leading school in the field of data science and information systems, with a strong track record in both applied research and European-funded projects. NOVA Information Management School (NOVA IMS) is keen to join a consortium for the upcoming Horizon Europe Cluster 3 calls: **HORIZON-CL3-2025-01-INFRA-01** ("Improved preparedness for, response to and recovery from large-scale disruptions of critical infrastructures") and **HORIZON-CL3-2025-01-INFRA-02** ("Role of the human factor for the resilience of critical infrastructures").

We host a strong team of researchers dedicated to modelling and simulating complex socio-technical systems, led by Professor Flávio Pinheiro: https://novaresearch.unl.pt/en/persons/fl%C3%A1vio-l-pinheiro.

What we do:

Empirically, we **specialise in inferring and mapping the multilevel network structures that underpin social, economic, educational and knowledge systems**. Theoretically, we simulate dynamical processes on those networks to quantify how topology shapes the diffusion of information, attitudes and innovations, and we analyse evolutionary contexts in which agents learn and adapt through social or reinforcement learning. This dual capability allows us to identify the strategic conditions under which external actors might manipulate or interfere with a system's functioning. Through computer-based simulations—calibrated with data when available or grounded in theoretically consistent assumptions—we generate hypotheses, quantify risks and develop quantitative indicators of resilience that capture the adaptive actions of strategic agents.

Topics we are interested in:

These competences dovetail with the objectives of both calls. For **INFRA-01** we can construct data-driven digital twins of interdependent infrastructures, perform multi-hazard stress tests, forecast cascade trajectories and support post-incident investigations, thereby enhancing preparedness, response and recovery. For **INFRA-02** we can model insider decision-making, learning and organisational norms, evaluate training interventions, and design privacy-compliant methodologies for background checks, thus addressing the human-factor dimension of infrastructure resilience. Our methodological depth in Deep Learning, Evolutionary Computing, Behavioural Sciences and Econometrics reinforces each of these contributions by enabling data fusion, policy optimisation, behavioural calibration and rigorous impact evaluation.

How we wish to participate:

NOVA IMS is actively seeking to join a consortium as a key partner, bringing our distinct capabilities to the project. Our potential contributions include leading or co-leading tasks or work packages related to network inference, complex-systems simulation, risk-indicator development, or practitioner-guided validation. We invite potential coordinators and partners interested in these capabilities to contact us to explore synergies and discuss a potential collaboration.

We are available for an online meeting to further explore the possibilities to collaborate (for these or other opportunities).