

FAIR – Multidimensional analysis of human network structures in OSN

Background

Social networks, both in the digital realm and in face-to-face interactions, have been the subject of extensive research spanning many decades. One pivotal aspect of these networks is the evaluation of the strength of the connections between individuals. Granovetter introduced the concept of "tie strength," which he described as a composite measure of four key elements within a relationship: the time invested in maintaining it, the emotional depth of the connection, the level of intimacy shared, and the mutual support or services exchanged. This definition holds significant importance in understanding how different users engage in social interactions. Nonetheless, tie strength in Online Social Networks has predominantly been assessed based on the frequency of contact.

Topic description

The goal of this research activity is to explore the hitherto underrepresented qualitative aspects of tie strength, in addition to the traditional metric of the time spent maintaining them. To accomplish this, innovative methods will be investigated to extract, from Online Social Network (OSN) data, tie strength measures revealing patterns that are potentially less quantitative and more qualitative in nature, as many of the Granovetter's dimensions of tie strength. We will explore how to build data-driven models from multiple OSN data types (not limiting only to straightforward features such as frequency of contacts) to characterise more precisely the tie strength, according to all the dimensions highlighted in the reference sociology/anthropology models (such as the Granovetter's model). The final objective would be to understand whether such a multidimensional data-driven analysis of human interactions in social networks suggests that well-established models for human network structures (like for example the ego network model outlines the structure of human social interactions) still hold, or if OSNs bring about a measurable change in their predictions.

The activities will build on the substantial experience of the supervisors in the characterization of human behavior in large-scale online platforms, such as OSNs.

We are looking for a graduate/post-doctoral research fellow to explore this topic. The activities will involve a mix of data collection, identification of suitable large-scale datasets, development of data analytics tools, analysis of the obtained results and definition of multidimensional cognitive and behavioral models for OSN.

Type of prospect positions

We plan to open positions at the level of Graduate Research Fellow or Postdoctoral Fellow on this topic.

Funding and partnerships

Supported by: [FAIR](#), Extended Partnership on Artificial Intelligence (funded by the National Recovery and Resilience Plan (NRRP), European Union - NextGenerationEU) and [ICSC](#) - National Research Centre for High-Performance Computing, Big Data and Quantum Computing.

Candidate profile

Ideal candidates should have or about to obtain a MSc (Graduate position) or PhD (post-doc position) in Computer Science, Computer Engineering, Mathematics, Physics, or closely related disciplines, and a proven track record of excellent University grades (Graduate position)/scientific publications (post-doc position). Preferably, the MSc/PhD should be in one of the relevant research areas: Artificial Intelligence, BigData analytics.

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