Online seminar

Tuesday May 04, 2021 at 15:00
Hosted on: Zoom

Domenico BRUNETTO
Politecnico di Milano

An Elementary Introduction to Social Network for Mathematics Education Research

Prof. Gasparini introduces the seminar.

Abstract

The last decades have witnessed the spreading of networks in many research fields, such as biology and informatics. The term 'network' refers to a complex system of objects. Objects are represented as nodes, while their relations are modelled with edges (or links). Objects can be either tangible, belonging to the physical world, such as electric power grids, transportation systems, or abstract, such as networks of biochemical reactions and collaborations between individuals. In this latter case, we refer to them as Social Networks, even though the two terms are used as synonymous. In the first part of this seminar, I present the elementary approach to capture the global properties of such systems: the graph, the adjacency matrix, and the main centrality indices. Then, I focus on community detection, a powerful tool for understanding the functioning of the network and the hierarchy of connections within a complex architecture. For example, tightly connected groups of nodes in a social network may represent individuals belonging to social communities and clusters in cellular and genetic networks are somehow related to functional modules. In particular, I report the use of modularity for identifying the communities within a criminal network.

In the second part of the seminar, I resort to the technique above to describe and analyse the attitudes of a set of students within a Mathematics Education research. More precisely, I propose a strategy to identify clusters of students with similar attitudes towards mathematics and its learning resorting to their answers to qualitative questionnaires.

Finally, I report the main results of such an approach within two research projects concerning undergraduate Engineering students. The first investigates the relationship between their attitudes towards digital resources (e.g. MOOCs) and mathematics. The second one investigates the perceived importance of the resources.

Biography

Domenico Brunetto is Junior Researcher at the Mathematics Department, Politecnico di Milano (Italy), where he teaches calculus for the Bachelor Degree in Architecture and Innovative teaching skill for PhD students. He received the doctoral degree in Mathematical Models and Methods in Engineering in 2018 at the Politecnico di Milano.

His main research interests concern: distance and blended learning, with a particular focus on MOOCs; the use of multimedia in classroom practices; interactions among students in small and large groups; real-life mathematical problems. His last research project was devoted to design and develop practices for teaching mathematics to young immigrants and to students with low socioeconomic status. His research in Mathematics Education is strongly characterised by hybrid methodologies that couple educational models, such as affect framework, and mathematical models, such as opinion dynamics. Domenico Brunetto is a member of the DIGiMATH board (UMI group) and in charge of the local activities for the PLS project (STEM degree project) funded by MIUR.

More info on **www.polito.it/disma-excellence**