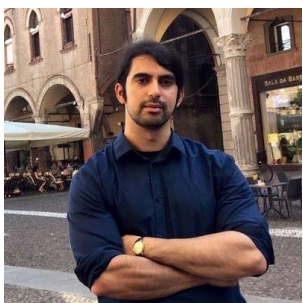


NETWORK STRUCTURE AND THE EXPLORATION AND EXPLOITATION OF COMPLEX TECHNOLOGICAL LANDSCAPES



A TALK BY

TAMER KHRAISHA

PhD Student, Center for Network Science, CEU

MONDAY, NOV 13, 1:30 P.M. | NÁDOR U. 11., ROOM 616

ABSTRACT | Besides being a primary and outstanding example for a complex economic problem, technological innovation is nowadays increasingly stylized as a 'collective' phenomenon of interactions between a multitude of innovating agents. The rationale behind the collective aspect of technological innovation is mainly attributed to the fact that information about known solutions can be dispersed among individual innovators, therefore making the development of a new innovation go beyond the inventive capacities of individual firms. Prior research on complex problem solving by collectives has found that the efficiency of networks, meaning the speed at which networks disseminate information, can have a relevant effect on the performance of the collective for problems that require extended exploration. In this talk, I will discuss the results of an evolutionary agent-based model in which a group of firms, constrained by absorptive and dynamic capabilities, collectively searched a complex (rugged) technological landscape and observed each other's solutions with different frequencies through different observation networks. Eight observation networks were considered, which varied in terms of efficiency. As the main result, it was found that collective exploration improved average performance over independent exploration because good solutions could diffuse through the network at an early stage. Moreover, it was found that efficient networks outperformed inefficient networks, independently of the size of the network and the frequency of observation. I will also discuss results relating to the performance of other network structures and a case study from financial innovation will be illustrated.

BIO | Tamer Khraisha is a Ph.D. candidate at the Center for Network Science with particular interests in evolutionary economics, collective innovation, and financial networks. Tamer holds a master's degree in Economics and Economic Policy and a B.A. in Financial Economics from the University of Bologna. His PhD thesis examines how the diffusion and evolution of technological innovations can be modeled as a process of collective search on networks using local information. He is also interested in the various techniques used in modeling space of technological solutions as a fitness landscape.