SOE 19: Networks: From Topology to Dynamics II (joint session SOE / DY / BP)

Time: Thursday 12:00–13:15 Location: MA 001

SOE 19.1 Thu 12:00 MA 001

Sensitivity against author name disambiguation of a motif-based success score in coauthorship networks — •David F. Klosik[1], Stefan Bornholdt[1], and Marc-Thorsten Hütt[2] — [1]Institut für Theoretische Physik, Universität Bremen — [2]School of Engineering and Science, Jacobs University Bremen

Motivated by the question whether large-scale citation datasets allow for a quantitative assessment of social influences in form of coauthorship of publications we investigate a success score [L. Krumov, C. Fretter, M. Müller-Hannemann, K. Weihe, and M.-T. Hütt, EPJ B (84), 535 (2011)] for small collaboration patterns in coauthorship networks. We find that when applied to a network compiled from aggregated citation data provided by the American Physical Society this score which is based on the scale of small induced subgraphs (as known from motif-analysis) is highly sensitive to details of the network construction from the data; especially to the inevitable disambiguation of author names (i.e., the scheme applied to group instances of author names into a vertex). We argue that these findings might not be exclusive to coauthorship networks since similar ambiguities are present in the network representations of other data [D.F. Klosik, S. Bornholdt, M.-T. Hütt, Phys. Rev. E 90, 032811 (2014)].

SOE 19.2 Thu 12:15 MA 001

Random Walks on Citation Networks — •Vimal Kishore and Eduardo G. Altmann — Max Planck Institute for the Physics of Complex Systems, Dresden, Germany

Scientific papers are the main source of communication of scientific ideas and are connected to each other through citations. The digitalization of articles allows scientists to easily trace not only the citations contained in a paper but also the citations a paper received. This motivates us to consider random walks on citation networks as models of the search of scientific information scientists perform. The spreading of the random walkers in the network provides information on the flow of scientific ideas across different publications and fields. We discuss different mechanisms leading to a sub-linear growth of the number of discovered papers as a function of random-walk steps.

SOE 19.3 Thu 12:30 MA 001

Restricting the h-index to a citation time window: A case study of a timed Hirsch index — •Michael Schreiber — Institut für Physik, TU Chemnitz

The h-index has been shown to increase in many cases mostly because of citations to rather old publications. This inertia can be circumvented by restricting the evaluation to a citation time window. Here I report results of an empirical study analyzing the evolution of the thus defined timed h-index in dependence on the length of the citation time window.

SOE 19.4 Thu 12:45 MA 001

An Interacting Network Perspective on Global Trade — •Julian Maluck and Reik V. Donner — Potsdam Institute for Climate Impact Research, Germany

In the last years the International Trade Network (ITN) has caught rising attention among the scientific community. By decomposing countries into national industry sectors, data provided by multi-regional input-output tables allow for a more detailed investigation into the substructure of the ITN. We introduce an interacting network approach to quantify trends and extreme events in global trade patterns between 1990 and 2011. Different definitions of subgraphs exhibit different characteristic topological features of the ITN. This study compares and evaluates partitions that are defined by industry sector and by country, respectively. We assess how meaningful the notion of national economies in present-day globalized economy still is and show that the approach of interacting networks provides suitable methods to perceive important patterns in global trade.

SOE 19.5 Thu 13:00 MA 001

From diffusion to evolutionary game theory on the multilayer — •Rubén J. Requejo, Nikos E. Kouvaris, and Albert Díaz-Guilera — Foundamental Physics Department, Universitat de Barcelona

I will present some results obtained within the LASAGNE project (multi-LAyer SpAtio-temporal Generalized NEtworks), starting with the effect of the multiplex structure on the diffusion of particles, following with the extension of agent-based dynamics to the multiplex by means of an evolutionary game theoretical model of interacting metapopulations, which shows the effect of the multilayer structure on the replicator dynamics, and finishing with the observation of chimera states in the multiplex for a public goods game with cooperators, defectors and jokers.