SOE 8: Social Systems, Opinion and Group Formation II

Time: Monday 17:15–18:30 Location: H17

SOE 8.1 Mon 17:15 H17

Towards realistic models for social feedback in opinion dynamics — •Felix Gaisbauer, Sven Banisch, and Eckehard Olbrich — Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany

In [1] a new mechanism to explain polarization phenomena in opinion dynamics based was proposed, which was based on social positive or negative feedback on expressed opinions. We showed that the opinion dynamics can be described as reinforcement learning in a coordination game and derived the structural condition on the network - the existence of more than one cohesive set - for the co-existence of different opinions in the network. In the present work we extend the approach by introducing costs for opinion expression, which means that opinions are only expressed if the agents are sufficiently convinced. Therefore, not every agent will express her opinion. Moreover, agents learn not only by the feedback on their expressed opinions, but also by the opinions expressed by others. We study how these additions affect polarization in different networks. Furthermore, we show that in this case - contrary to the original model - a small cohesive group of strongly convinced agents can convince a larger group of less convinced agents with an initially different opinion.

[1] S. Banisch & E. Olbrich (2018) Opinion polarization by learning from social feedback, The Journal of Mathematical Sociology, DOI: 10.1080/0022250X.2018.1517761

SOE 8.2 Mon 17:30 H17

Inferring follower-followee relations from presence data. Manta Rays case study. — •Juan Fernández-Gracia[1], Jorge P. Rodríguez[1], Lauren Peel[2], Konstantin Klemm[1], Mark Meekan[2], and Víctor M. Eguíluz[1] — [1]Instituto de Física Interdisciplinar y Sistemas Complejos IFISC (CSIC-UIB), E07122 Palma de Mallorca, Spain — [2]Australian Institute of Marine Science, Indian Ocean Marine Research Centre (IOMRC), University of Western Australia (M470), 35 Stirling Highway, Crawley, WA 6009, Australia

Social interactions are ubiquotous in groups of animals, including humans. These interactions might be of different nature, e. g. competitive, mutualistic, kinship, etc; and their global structure is naturally studied with the tools of complex network theory. Here we propose a method to extract follower-followee networks from presence data at a certain location. The method is based on the Kolmogorov-Smirnov distance between the distribution of waiting times between the consecutive presence of an individual i followed by the presence of j in the vicinity of a particular location and its conjugate distribution, i.e., j's presence followed i's. Using this method we construct the follower-followee network of manta-rays and characterize mantas in terms of their position on this network, paying attention to sex and size.

SOE 8.3 Mon 17:45 H17

It Don't Mean a Thing, If It Ain't Got That Swing: Unraveling a Musical Mystery by Scientific Means? — •George Datseris[1,2], Annika Ziereis[3], Thorsten Albrecht[3], York Hagmayer[3], Viola Priesemann[1,2], and Theo Geisel[1,2] — [1]Max Planck Institute for Dynamics and Self-Organization — [2]Department of Physics, Georg-August-University Goettingen — [3]Georg-Elias-Mueller Institute for Psychology, Georg-August-University Goettingen

The so-called swing feeling in jazz performances has puzzled musicologists and jazz critics for decades. For a long time it was believed that one can feel it, but one cannot explain it. More recently discussions focused on the role of microtiming deviations (MTDs, temporal deviations below the phrase level); some musicologists have claimed that they are essential for the swing feeling.

Our group has analyzed these MTDs in detail and found e.g. differences between swinging jazz and rock/pop music on time scales typically below 2 bars. Moreover, to answer whether they are relevant for the swing feeling we carried out an online survey using jazz recordings in which we had systematically manipulated MTDs - exaggerating, deleting, and inverting them. We found that the presence of microtiming deviations is not essential for the "swing" feeling as versions without microtiming deviations were preferred, in contrast to the common belief of many musicians and musicologists.

SOE 8.4 Mon 18:00 H17

Growth and ergodicity breaking in ecosystems and social systems — •Jan Nagler — Frankfurt School

As highlighted in a recent perspective article [Science 359: 738, 2018], in ecology exact predictions are extremely challenging. In the presentation, we ask how do species evolve in environments with asymmetric fluctuating temperature profiles. We study how natural selection do not lead to adaption to the mean temperature but to a value that is shifted and given by the skewness of the temperature profile (and also by the fitness function of the species). This prediction is derived from first principles and first results are presented in nematodes (in vitro). More generally, we discuss effects from ergodicity breaking for evolutionary game theory [PRL 120: 058101, 2018], coupled ecosystems and for climate change.