SOE 14: Social Systems, Opinion and Group Dynamics III

Time: Wednesday 14:00–16:00 Location: H44

SOE 14.1 Wed 14:00 H44

Why is women football less attractive ? — •Metin Tolan — TU Dortmund, Fakultät Physik & DELTA

It will be shown that the final table of the German (men's!) football Bundesliga and the distribution of the results may be explained by simple statistical distributions. From this observation, one may conclude that the differences in the performance of the teams are not very large although certain teams from the southern part of Germany perform significantly better than others over the years. With such an analysis large-scale manipulations in the German Bundesliga, the English Premier League, and the Italian Serie A may be ruled out.

The same analysis reveals a completely different picture for the German women football Bundesliga and the Word Cup women football teams. The respective goal distributions can not be explained with simple statistical models because the difference in the performance of the teams is too large. The reason for this finding is simple and will be discussed at the end of the talk.

SOE 14.2 Wed 14:15 H44

The Utility of Dismissing the Coach in Professional Soccer — •Andreas Heuer[1], Christian Müller[1], Oliver Rubner[1], Bernd Strauss[2] und Norbert Hagemann[2] — [1]WWU Münster, Inst. f. Phys. Chemie — [2]WWU Münster, Institut f. Sportwissenschaften

A frequent response to a series of lost matches in team sports is to change the coach mid-season. The empirical data (German Premier Soccer League; 1963-2008) show in qualitative agreement with a previous study [1] that immediately before the dismissal the results became worse. After the dismissal one observes a significant improvement of the results for that team even as compared to the average results in the whole season before the dismissal. In this contribution these data are interpreted on a quantitative basis. We make use of our previous results about the underlying statistical properties of a soccer league [2]. Of particular relevance is the well-defined concept of the team fitness. In qualitative agreement with [1] a careful application of these concepts allows us to show that the team fitness is not(!) improved as a consequence of the dismissal of a coach. The apparent improvement of the results is just a consequence of the "regression towards the mean" and thus just a merely statistical effect since it would have also occurred without the dismissal of the coach. [1] Breuer, C. & Singer, R. (1996). Leistungssport, 26 (4), 41-46. [2] Heuer, A. & Rubner, O. (2009). European Physics Journal B, 67, 445-458.

SOE 14.3 Wed 14:30 H44

The Personnel Portfolio: An Application for Agent based Models — •Magda Schiegl — Fachhochschule Köln, Claudiusstr. 1, 50678 Köln

The personnel portfolio of a company can be described by an agent based model. The agents correspond to the employees of the company. They are characterised by several internal parameters as for instance age, sex, number of years working with the company and level of education. Depending on these quantities the employees will (with some probability) lose their motivation, leave the company, retire or stay (with more or less chanced internal parameters) with the company. The model is calibrated by the help of empirical statistics from human resource data. We investigate the dynamics of the personnel portfolio: The number of employees and the level of motivation. We compare the results of the model with empirical data and knowledge of human resources department. Interesting questions in this regard are: What role does the organisational structure of a company play? Is there an influence by the class of business?

Possible applications of the model are: detecting and removing inefficiencies in companies arising from the personnel portfolio and its development over time; objective inclusion of soft facts in company rating systems; investigation of prosperous employing strategies for the future development of the company.

SOE 14.4 Wed 14:45 H44

Climate Change and Societal Instability: Modeling Conflict and Cooperation of Agents in Complex Social Networks — •Jürgen Scheffran — Institut für Geographie, KlimaCampus, Universität Hamburg, Bundesstr.53, 20146 Hamburg

Global warming has significant potential implications for security and conflict. Various studies suggest that climate change aggravates environmental degradation and resource scarcity which may contribute to environmental conflicts and mass migrations. On the other hand, more cooperation may emerge to address the problems and risks. This contribution analyses the potential for climate-induced societal instabilities within a conceptual framework of conflict and cooperation of multiple agents in complex social networks. A macro-level analysis of regional impacts of climate change will be integrated with micro-level analysis of potential environmental conflicts and the possibility of cooperation and coalition formation to address the challenges, with a focus on regional cases in the Mediterranean region.

SOE 14.5 Wed 15:00 H44

Optimization of the distribution of students to universities in Germany — •Christian Hirtreiter[1] and Johannes J. Schneider[2] — [1]Faculty of Physics, University of Regensburg, 93040 Regensburg, Germany — [2]Center for Computational Research Methods in Natural Sciences, Johannes Gutenberg University of Mainz, Staudinger Weg 7, 55099 Mainz, Germany

For some subjects to study, the number of students being allowed to study this subject is restricted, due to finite capacities of universities. While formerly a central agency called ZVS was solely responsible for the distribution of students applying for a place to study at one of their desired universities, nowadays, a decentralized approach is used in which students apply directly at universities for a place to study. Both approaches fail partially: the ZVS often sent students to universities at which they did not want to study in the first place. The current method leads to a large administration overhead, students not being able to take up their studies in time, and on the other hand free places still available when the semester starts.

Based on multi agent system simulations, we present various approaches of how to distribute students, e.g., by allowing elite universities to perform a preselection. We will show that an optimized centralized approach leads to the best results, decreasing the factor of frustrated students by a factor of 2, if compared to the old ZVS approach.

SOE 14.6 Wed 15:15 H44

Information Theory as a Basis for Iustitia Distributiva — •Jörg Becker — ICAS e.V., Starnberg

It is still an open question how to distribute justly the fruits of economic activities in society. The French Revolution has left us with three competing terms: Liberté, Egalité, Fraternité. Today, speaking in philosophical terms, the discussion is about liberalism (capitalism?) and egalitarianism (communism?). However, there is a third way in philosophy: it is intuitionism. Asking a large number of individuals and taking the averages in concrete cases results in a clear distribution. We argue that there must be a principle behind such a distribution, and that information theory provides a natural basis for understanding it. We also consider some instructive examples.

SOE 14.7 Wed 15:30 H44

Emergence of collective memories — Sungmin Lee[1] and •Petter Holme[1,2] — [1]Department of Physics, Umea University, 90187 Umea, Sweden — [2]Department of Energy Science, Sungkyunkwan University, Suwon 440-746, Korea

Causality is intimately linked with understanding. Understanding an event is semantically almost equal to identifying its causes. A causal link is a mental pairing, ordered in time, between two events. Understanding an episode of history is to identify a chain, or web, of such causal relationships. Our mental picture of history, at all levels, takes the form of such directed causal networks. In this work we investigate how people collectively understands history and how communication affects this understanding. As a starting point, we analyzed anthropological data collecting the life stories of 14 villagers in northern China. We characterize the network topology, including a skewed distribution of both in- and out-degree (the number of events leading to another event, and the number of events caused by an event, respectively). We also find cycles (inconsistencies in the aggregate picture of history). We make an agent-based model investigating the stability of collective memories like this data set. This model shows a tendency for disjoint clusters to form, a cluster being defined as a set of agents having a sim-

ilar mental pictures of history, which echoes observations from cultural groups in conflict with different ways of narrating the same historical episode.

SOE 14.8 Wed 15:45 H44

Stochastic model of group affiliation for an online community — •Przemyslaw A. Grabowicz[1], Dario Taraborelli[2], and Víctor Eguíluz M.[1] — [1]IFISC, Campus Universitat de les Illes Balears, E-07122, Palma de Mallorca, Spain — [2]Centre for Research in Social Simulation, University of Surrey, Guildford GU2 7XH, United Kingdom

Flickr is an image and video hosting website and online community platform [1]. It is one of the earliest Web 2.0 applications. Members of the Flickr create its contents which are photos, tags, comments and groups. Users interact between themselves forming network of contacts, creating groups of common interests and producing collaborative contents for those groups. It has already been shown that social network formed in such a systems plays important role in information diffusion processes [2]. In this contribution we focus on the interaction between social network topology and group affiliation patterns. It is being predicted that homophily play important role in such a systems [3]. Using the data collected for the Flickr we quantify the importance of homophily in a real system. We introduce a stochastic model of groups and social ties dynamics in Flickr accounting for the findings.

[1] www.flickr.com [2] M. Cha, A. Mislove, B. Adams, K.P. Gummadi, Characterizing Social Cascades in Flickr, (2008) [3] Geard, N. and Bullock, S. Homophily and competition: a model of group affiliation, (2009)