SOE 11: Opinion Formation II

Time: Tuesday 11:15–11:45 · Location: H37

SOE 11.1 Tue 11:15 H37

Opinions, Conflicts and Consensus: Modeling Social Dynamics in a Collaborative Environment — •János Török[1], Gerardo Iñiguez[2], Taha Yasseri[1], Maxi San Miguel[3], Kimmo Kaski[2], and János Kertész[4,1,2] — [1]Institute of Physics, Budapest University of Technology and Economics, H-1111 Budapest, Hungary — [2]Department of Biomedical Engineering and Computational Science, FI-00076 Aalto, Finland — [3]FISC (CSIC-UIB), Campus Universitat Illes Balears, E-07071 Palma de Mallorca, Spain — [4]Center for Network Science, Central European University, H-1051 Budapest, Hungary

Information-communication technology promotes collaborative environments like Wikipedia where, however, controversiality and conflicts can appear. To describe the rise, persistence, and resolution of such conflicts we devise an extended opinion dynamics model where agents with different opinions perform a single task to make a consensual product. As a function of the convergence parameter describing the influence of the product on the agents, the model shows spontaneous symmetry breaking of the final consensus opinion represented by the medium. For the case when agents are replaced with new ones at a certain rate, a transition from mainly consensus to a perpetual conflict occurs, which is in qualitative agreement with the scenarios observed in Wikipedia.

SOE 11.2 Tue 11:30 H37

Stochastic model for the vocabulary growth in natural languages — •Martin Gerlach and Eduardo G. Altmann — Max-Planck-Institute for the Physics of Complex Systems

We propose a stochastic model for the number of different words in a given database which incorporates the dependence of the database size and historical changes. The main feature of our model is the existence of two different classes of words: (i) a finite number of core-words which have higher frequency and do not affect the probability of a new word to be used; and (ii) the remaining virtually infinite number of noncore-words which have lower frequency and once used reduce the probability of a new word to be used in the future. Our model is motivated by a careful analysis of the google-ngram database of books published in the last centuries and its main consequence is the generalization of Zipf's and Heaps' law to two scaling regimes. We confirm that this approach yields the best simple description of the data among generic linguistic models and that the two free parameters depend only on the language but not on the database. From the point of view of our model the main change on historical time scales is the composition of the specific words included in the finite list of core-words, which we observe to decay exponentially in time with a rate of approximately 30 words per year.