TUT 2: Stochastic Processes of Opinion Formation (joint session SOE/TUT)

Time: Sunday 16:00–18:15   Location: HSZ 02

Tutorial   TUT 2.1   Sun 16:00   HSZ 02

Bounded Confidence Revisited: What We Overlooked, Underestimated, and Got Wrong — •Rainer Hegselmann — Frankfurt School of Finance & Management, 60322 Frankfurt, Adickesallee 32-34

The talk will discuss the so called bounded confidence model (BC-model, for short). The model is very simple: Period by period, all agents average over all opinions that are not further away from their actual opinion than a given distance Epsilon, their *bound of confidence*.

The simplicity of the model is deceptive. Two decades ago, Ulrich Krause and me published an analysis of the model in which we overlooked completely a decisive feature of our model: For increasing values of Epsilon, our analysis back then suggests smooth transitions in the model*s behavior. But in fact, the transitions are wild, chaotic, and non-monotonic.

In my talk I will present a new type of approach in which everything we overlooked at the time becomes directly obvious and, in a sense, unmissable. Key component of the new approach is an algorithm that identifies, exactly and exhaustively, all bounds of confidence, that make a difference. We get a list that, then, allows direct checks for wild behavior exhaustive of all possible cases. That is a good news. But it is accompanied by a bad one: The algorithm that does the work, requires an absolutely exact fractional arithmetic with integers of arbitrary length. As a consequence, we have to pay a price in terms of computational speed.

Tutorial   TUT 2.2   Sun 16:45   HSZ 02

When intuition fails: the complex effects of assimilative and repulsive influence on opinion polarization — •Michael Maes[1], Andreas Flache[2], Shuo Liu[3], and Haoxiang Xia[3] — [1]Karlsruhe Institute of Technology, Karlsruhe, Germany — [2]University of Groningen, Groningen, The Netherlands — [3]Dalian University of Technology, Dalian, China

There is a debate about whether personalized services of social-media platforms contribute to the rise of bipolarization of political opinions. On the one hand, it is argued that personalized services of online social networks generate filter bubbles limiting contact between users who disagree. This reduces opportunities for assimilative social influence between users from different camps and prevents opinion convergence. On the other hand, empirical research also indicated that exposing users to content from the opposite political spectrum can activate the counter-part of assimilative influence, repulsive influence. Fostering contact that leads to opinion assimilation and limiting contacts likely to induce repulsive interactions, it has been concluded, may therefore prevent bipolarization. We demonstrate that these conclusions fail to capture the complexity that assimilative and repulsive influence generate in social networks. Sometimes, more assimilative influence can actually lead to more and not less opinion bipolarization. Likewise, increasing the exposure of users to like-minded individuals sometimes intensifies opinion polarization.

Tutorial   TUT 2.3   Sun 17:30   HSZ 02

How growing connectivity and self-organization changes opinion dynamics — •Philipp Lorenz-Spreen — Center for Adaptive Rationality, Max Planck Institute for Human Development, Berlin, Germany

Information technology has made various aspects of our lives more dynamic and self-organized. Connections with others can be made across spatial and socio-demographic boundaries and undone with the click of a button. Since the famous six degrees of separation, networks seem much more connected; Facebook reports 3.5 degrees of separation on its friendship graph. Yet there have been repeated reports of segregated, homophilic network structures and related trends of increasing polarization on most online platforms. The mechanism that could resolve this apparent paradox may lie behind the question of whether we change our opinions according to our friends or whether we change our friends according to our opinions. We have recently proposed that an agent's opinion changes as a process of mutual reinforcement within clusters of shared attitudes and a coevolution of the associated network structure that dynamically adapts to changing opinions and follows a probability distribution governed by homophily. This combination helps explain the potential emergence of increasing polarization even as connectivity increases. Moreover, extending this model to multiple dimensions of topics can explain the empirical observation of increasing alignment of issues, where opinions become increasingly correlated within ideological clusters.