

## SG\_Seminar

# Local consensus in Hegselmann-Krause opinion dynamics model

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We analyze the clusters produced by Hegselmann-Krause (HK) model of opinion dynamics: Agents have an opinion represented by a real number, which they all synchronously update by averaging the agent opinions differing from their by less than a pre-specified confidence radius  $R$ . This model leads to the emergence of local consensuses, i.e., of a certain number of clusters in which all agents have the same opinion. A rapid theoretical analysis shows that the opinions in different clusters differ by at least the confidence radius  $R$ . The experimentally observed differences are however significantly larger than  $R$ , and typically close to  $2R$ . This phenomenon is also observed for various similar models. We propose an explanation based on the possibility for some isolated agents to force consensus between arbitrarily large clusters of agents whose opinions are not different enough. Our explanation is corroborated by simulations and by theoretical results. We also exhibit the importance of the nature of the opinions, extending HK model to cyclic variables such as a time in the day or in the year. We show that in this case, although the agents locally follow the same rules as in the HK model, their behaviour can be dramatically different on the long term.

**When?** Monday, 22 September 2008, 16.00-17.00

**Where?** ETH Zürich, Kreuzplatz 5, KPL F 39