

Draft, Version 1 - State of the art analysis

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1 What is the problem addressed?

Humans are social creatures and thus they participate in social networks. These networks involve an interaction of large numbers of people who all have opinions. In part, these opinions are formed through communication and information exchange with other people. An emergent property of these social networks is group-formation and, as a consequence, group segregation and opinion radicalisation. Due to the high number of social interactions, chain reactions or cascades of events are not unusual, which makes it too difficult to predict opinion dynamics using purely analytic methods. Hence, agent-based modeling can cast some light on the evolution of social outcomes in social networks.

2 What is the state of the art concerning this problem?

In 2013, Dykstra et al. put forward a multi-agent system framework called DIAL to model opinion dynamics in social networks. DIAL (short for dialogue) is a space in which agents compete for reputation points by making statements and arguing with each other. A notable difference compared to previous work in this field is the inclusion of theory of mind, as agents are able to reason about other agents' beliefs. DIAL is a simple model that is theoretically informed by theories from social psychology, including social judgement theory REF and the theory of reasoned action.

3 What is the new idea for addressing this problem?

We argue that Dykstra et al. model opinion dynamics based on incomplete assumptions. In particular, people derive a major part of their information, and ergo opinion formation, from large broadcasters such as television programs, newspapers, and online blogs or magazines. These organisations differ from

normal people in several ways. Firstly, they usually have a much larger following that does not depend on social relations but rather political affiliation. Secondly, their views tend to remain quite consistent, whereas individual views are often subjected to large volatility REFERENCE. And thirdly, and maybe most importantly, the diversity in media opinions is not necessarily a reflection of a population's diversity of opinion, even in societies that explicitly value free speech REFERENCE. As media has an undeniable influence on a population's opinion formation, we propose to extend the DIAL framework by introducing so-called media agents / broadcasting agents and investigate the consequences on social outcomes.

4 What are the results? (expected or established)

As their central conclusion, Dykstra et al. showed that radicalisation is either prevented or facilitated depending on whether agents conform to information or norms, respectively. In other words, individual agents exhibit opinion radicalisation if their reputation is largely determined by assimilation to their normative environment, not by winning debates.

5 What is the relevance of this work?

Modeling opinion dynamics in social networks can help us better understand phenomena like online radicalisation, the filter bubble effect or even major political upheavals such as the Arab spring. In particular, improving the comprehension of what effect large media outlets have on individual and group opinion can help to promote an environment of conducive compromises rather than polarisation and divisiveness.