COST Action IC1205 on Computational Social Choice: STSM Report
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Summary: During my visit at the University of Oxford I discussed with Edith Elkind several models connecting voting scenarios with an underlying social network of the voters. The original plan was to end up with an appropriate model for coalition formation. However, we discovered that only little is known already for very basic questions of how opinions propagate in social networks.

We started to formalize a simple model of a voter network where each voters has a binary opinion about a certain issue. Voters may change their opinion in a dynamic process when enough (e.g. a strict majority) of their friends have a different opinion. We discovered that this process converges to a stable outcome (no voter will further change her opinion) if updates are performed asynchronously (this was known for closely related models in the literature). The particular outcome however depends on the ordering of updates.

Next, we aimed to find out how powerful the operator a social network is in such situations. To this end, we investigated whether only small changes in the network (e.g. disabling a link between two people) can change the outcome. Since such actions can indeed have a huge influence on the outcome, we analyzed the computational complexity of changing the outcome of the process by disabling as few links as possible. Our first findings indicate that this problem is computationally intractable for general social network, but easy for special classes of networks like paths or treelike networks. Interestingly, the ordering of the updates seems to be unimportant for showing hardness but decisive for the design of algorithms.

Besides the very fruitful discussions with Edith Elkind, this visit also enabled excellent opportunities to explore new and continue existing collaborations with other members of her group.