

Analysis of untrusted person and charismatically popular person using opinion dynamics approach

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Opinion dynamics is important in analyzing social consensus formation and majority formation. Consensus formation will also be important in the sense of avoiding the social crisis. Recently, we present new opinion dynamics theory[1, 2] as an extension of the bounded confidence model. The characteristic of this new opinion dynamics theory is that the relationship between people and people has introduced trust and sluggishness in the trust relationship.

We use the following equation of the new opinion dynamics theory[2] in this research.

$$\Delta I_i(t) = c_i A(t) \Delta t + \sum_{j=1}^N D_{ij} \Phi(I_i(t), I_j(t)) (I_j(t) - I_i(t)) \Delta t \quad (1)$$

where $\Phi(I_i, I_j) = \frac{1}{1 + \exp(\beta(|I_i - I_j| - b))}$.

Here, the agent's opinion at time t is $I_i(t)$ and D_{ij} and D_{ji} are independent. Usually, D_{ij} is an asymmetric matrix; $D_{ij} \neq D_{ji}$. $D_{ij} > 0$ means trust and $D_{ji} < 0$ means untrust.

Fig.1 shows an example calculated for 300 people using the new opinion dynamics theory of the paper. The mutual D_{ij} value between 300 people is decided by homogeneous random number between -1 and 1. We set one person would be the untrusted person. We also consider a charismatic person where every person has strong confidence to him in the calculation.

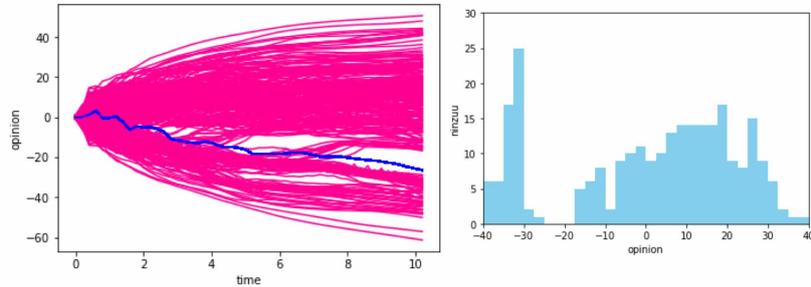


Figure 1: Simulation for $N=300$ with one charisma. The coefficient D_{ij} from all people to the charisma is -2.0. The other coefficients are determined by random number between -1 to 1. The left means the trajectory of opinions of 300 people. The blue line means the trajectory of the untrusted person. The right is the opinion distribution.

References

- [1] Akira Ishii and Yasuko Kawahata, "Opinion Dynamics Theory for Analysis of Consensus Formation and Division of Opinion on the Internet", IES2018, 71-76
- [2] A. Ishii, "Opinion dynamics theory considering trust and suspicion in human relations" Proceeding of 19th International Conference on Group Decision and Negotiation in 2019 , Springer LNBIP proceedings, in press