M. ITO LAB.

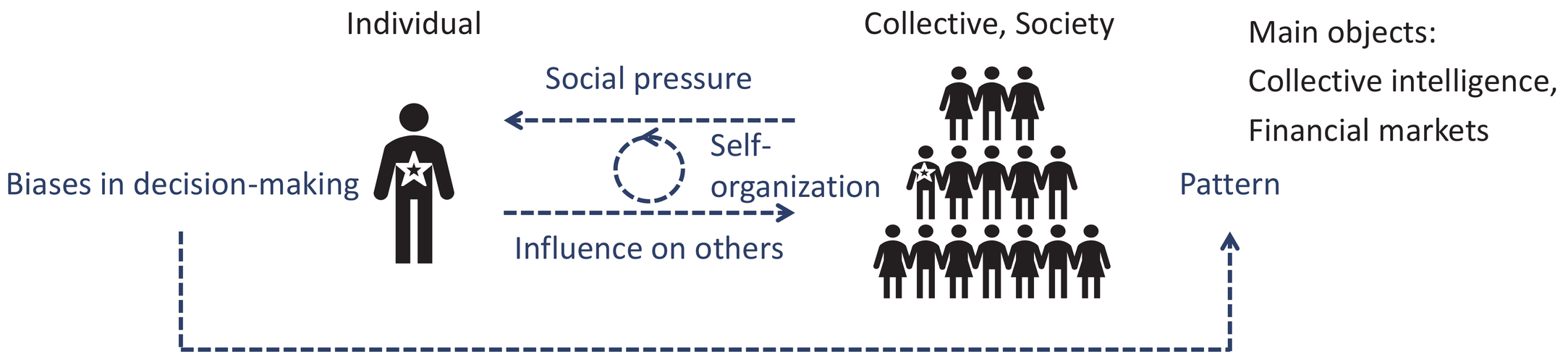
Self-organization of collective decision-making

Department of Human and Social Systems
Center for Social Complex Systems

Mathematics for Collective Decision-Making

Self-organization of collective decision-making

The decision-making of each individual and the collective is affected by each other. We focus on the patterns within collectives formed through such mutual interactions.



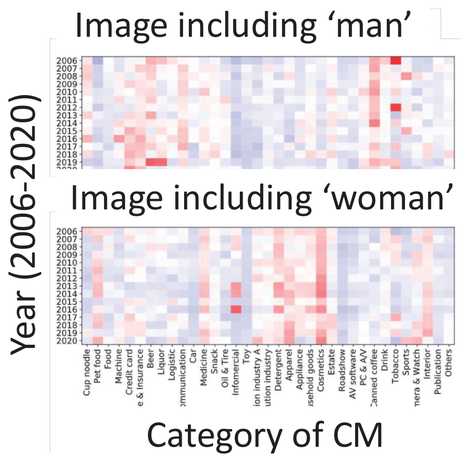
Investigation of collective decision-making using mathematical approaches

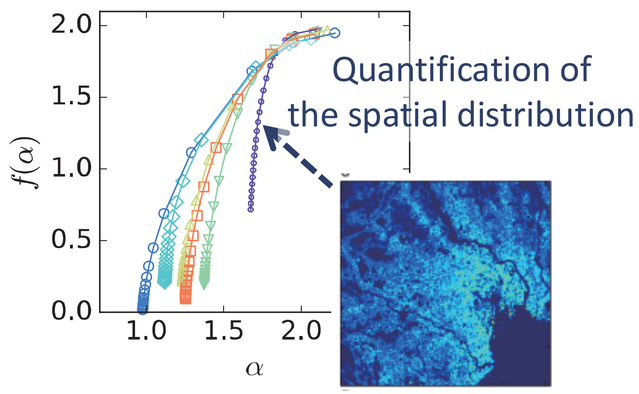
We investigate patterns in collective decision-making and society using analytical calculations and data analysis.

❖ Algorithm for maximizing an individual's accuracy in collective decision-making

$S = \{1\}, T = \emptyset, R = \emptyset$
for $2 \le n \le N$ **do**
  if $\sum_{m \in S} r_m^* - \sum_{m \in T} r_m^* > r_n^*$ **then**
    $R \leftarrow R \cup \{n\}, Y_n = s$
  else if $\sum_{m \in T} r_m^* - \sum_{m \in S} r_m^* > r_n^*$ **then**
    $R \leftarrow R \cup \{n\}, Y_n = t$

❖ Capturing hidden patterns in society through the analysis of socioeconomic data





Who decides and when?

The timing of individuals' decisions significantly affects the correlation structure of individuals' opinions. We are focusing on the heterogeneous distribution of individuals' decision timings.