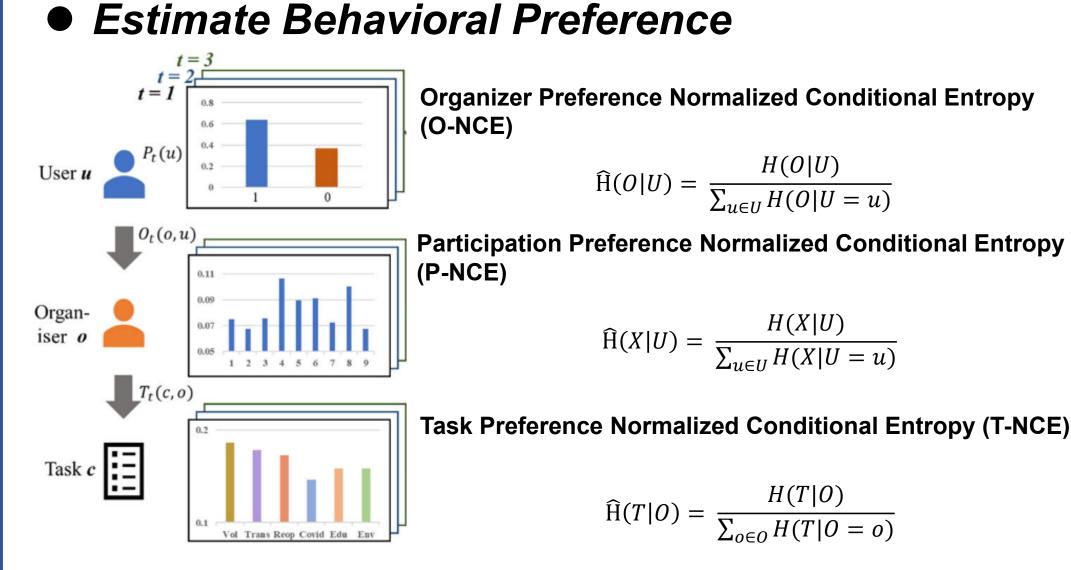
Optimizing Self-Organized Volunteer Efforts in Response to the COVID-19 Pandemic TBS Anping Zhang¹[#], Ke Zhang¹[#], Wanda Li¹, Yue Wang², Yang Li¹^{*}, Lin Zhang¹ 1. Tsinghua Berkeley Shenzhen Institute, Tsinghua University 2. Department of Electrical Engineering, Tsinghua University # First Co-authors * Corresponding Author **Research Questions** Self-organization in Task Selection Behavior Week 1 Week 2 Week 3 Week 4 COVID COVID COVID Environmental How to quantify and explain the COVID Educational effectiveness of different volunteer organizational schemes? Volunteering Reopening Reopening Volunteering Volunteering

Self-organisation: a process in which system entropy **first increases and then** decreases, in the absence of an apparent external force.

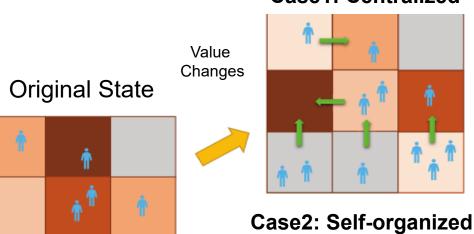
Optimize Organizational Effectiveness





Self-organization in Volunteer Behavior

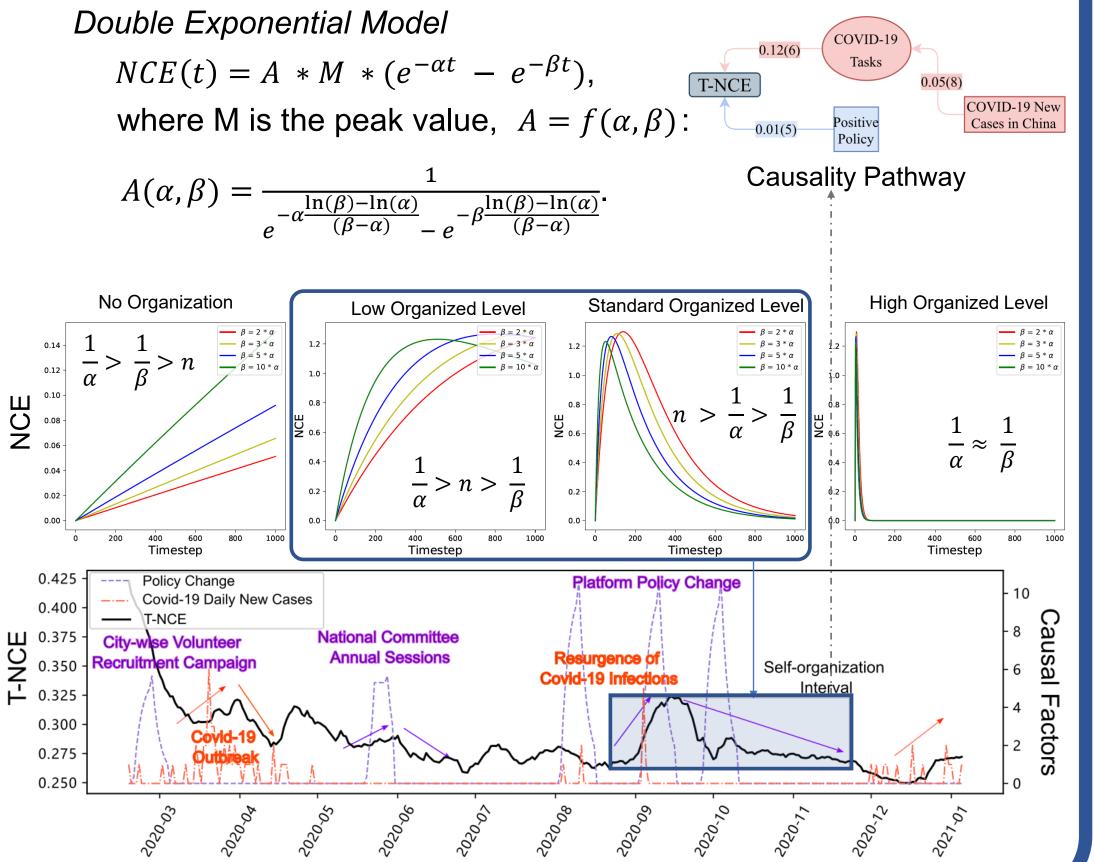
Agent-based Simulation Setup **Case1: Centralized**

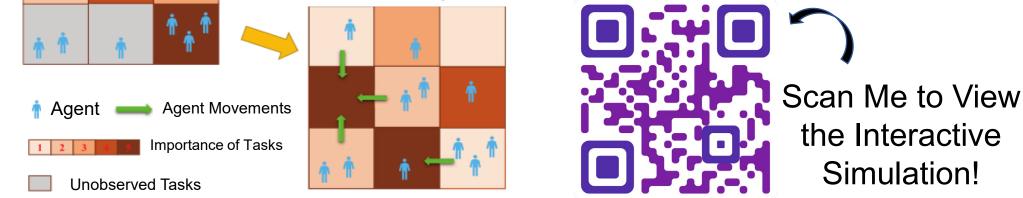


Model Parameters:

- Scheme Type
- Number of Agents
- Observation Demand Rate (κ)
- Grid Value Change Frequency
- Number of Centralized Steps

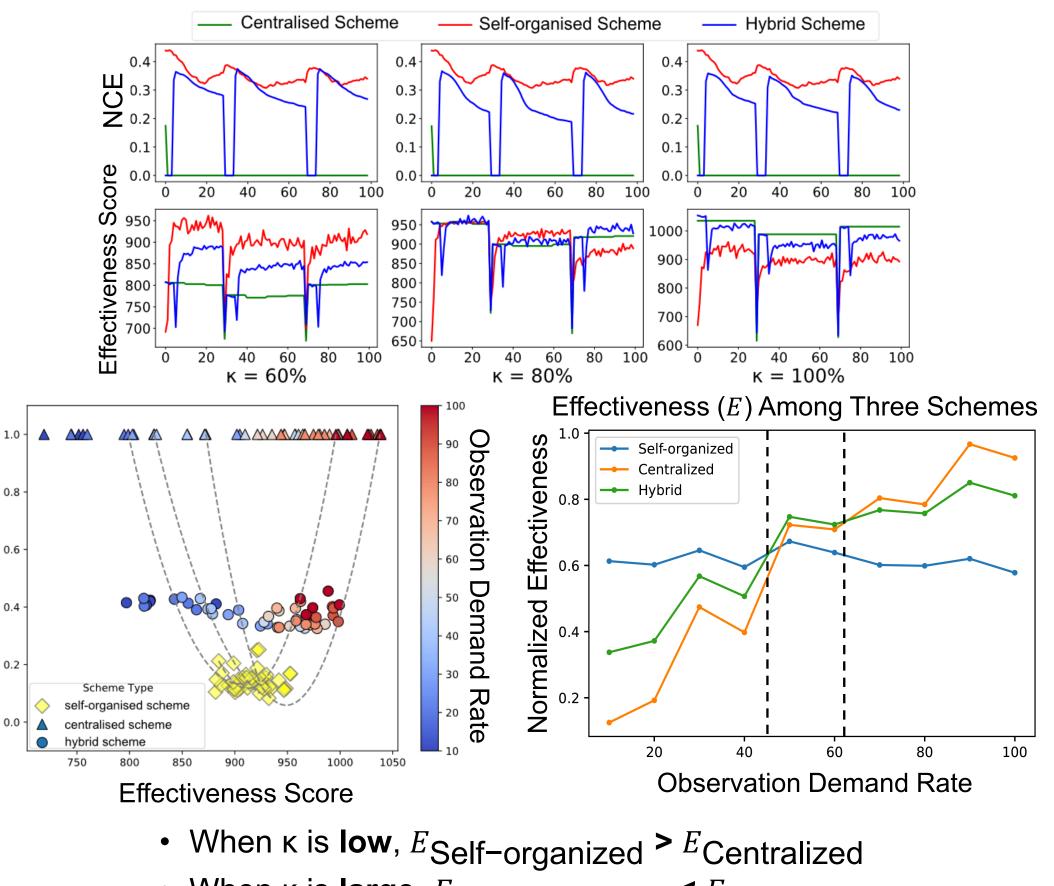
Self-organization of Shenzhen Volunteers





Simulation Results

Comparisons Under Different κ (Fraction κ of the Task Values)



When κ is large, ^ESelf-organized < ^ECentralized

Conclusions **Top-down centralized** leadership combined City Gov City Gov Participant City Gov with bottom-up self-Task Organiser organization can respond to the rapidly Community changing external Organise Tasks environment and generate the strongest **Centralized System Self-organized System** Hybrid System organizational **Adaptive Demand Response** effectiveness. **Fast Organization**

Speed

Organizational

Reference & Acknowledgements

Zhang, Anping, et al. "Optimising self-organised volunteer efforts in response to the COVID-19 pandemic." Humanities and Social Sciences Communications 9.1 (2022): 1-12.

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