YouTube's Silent Echo: Project Overview

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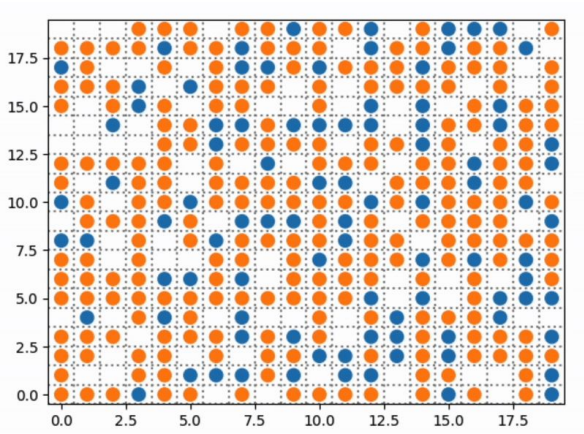
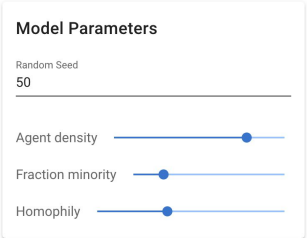
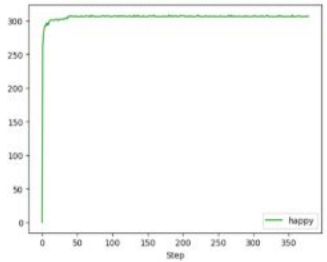
- Phenomena of interest:
  - Echo chambers on YouTube reinforced by its recommendation algorithm and bot interactions
  - Users are repeatedly exposed to content that reinforces their beliefs while filtering out opposing views
  - Key Dynamic: Mild Ideological Echo Chambers
- Sources & Relevance:
  - Two academic sources: YouTube's algorithm reinforces beliefs and cultural norms shape echo chambers
- Goals:
  - Simulate echo chamber formation using agent-based modelling
  - Analyze the impact of recommendation algorithms and social bots
  - Explore ways to reduce ideological reinforcement and improve content diversity

Simulation Entities & Expected Outcomes







- **Human users**
  - Users that consume and engage with content
  - Represented as user agent nodes with a content preference
- **Social bots**
  - Fake users that artificially boost engagement by mimicking human behaviour
  - Represented as marked nodes with a content preference
- **YouTube algorithm**
  - Prioritizes high-engagement content to maximize user engagement
  - Represented as marked nodes

Successful simulation shows:

- **Clustering Pattern**
  - clear formation of groups where agents with the same content preference (blue or orange) are grouped together
  - shows that users only see content similar to what they already like
- **Happy Agents**
  - There would be a high percentage of “happy” agents, in this case if they are beside three or more agents with the same interest as them (same colour)
  - shows that users become isolated from different viewpoints
- **Less interactions**
  - On the step graph we would initially see a huge spike in the number of happy agents but after it stays relatively the same
  - shows that Youtube algorithm continuously recommends the same content type to the same group of people