

SCAMP

Social Causality with **A**gents using **M**ultiple **P**erspectives: A Novel Approach to Understanding Network-based Social Phenomena

Current Approach to Network-based Social Phenomena

There is a deep body of research and theory on emergent effects in networks. To name but a few, the network lens has been applied to phenomena such as disease transmission, personal behavior, rumor and fake news, innovation adoption, and political and social change. The list could go on and on. A common feature of this research is that it identifies nodes as people or groups (agents), and edges as interaction (e.g. communication, influence) among agents.

SCAMP

SCAMP is a network-based scenario-simulation methodology whose runs can reveal new understanding about known topics of research, and also, reveal hitherto unrealized research questions. SCAMP has this capacity because it treats networks in novel ways.

People/groups → Events

Nodes in SCAMP networks do not represent people or groups. They represent events. Edges in SCAMP do not represent communication or influence. They represent agents' choices as agents participate in successive events based on their individual preferences, the flow of information that results from their decisions, their actions, and their associations with one another. Relationships among events fall into three categories: 1) agent choice, 2) inhibit, and 3) support. If an event involves movement through physical space, SCAMP can also model that movement, including spatially-based interactions among agents.

Goals

To the extent that traditional network analysis is concerned with what agents "want", those desires are incorporated into the rules that govern agent behavior. Agents' goals are not treated as separate entities in their own right. SCAMP includes goal hierarchies that are relevant to each agent group. The degree of goal satisfaction within the hierarchy influences agent decisions as they move from event to event. SCAMP allows different hierarchies for different agents, and also, for linked goals across hierarchies.

Event networks differ from goal networks

In SCAMP the rules that govern agents' movement across events are different from the rules that govern relationships among levels in goal hierarchies. Event movement is driven by an agent's "personality" (e.g. preferences, affiliations). The state of a goal network is driven by changes in the degree to which events in the world satisfy various goals.

Event networks and goal networks are connected

Selected events in an event network are connected to selected goals. Event activity influences those goals. Conversely, goal satisfaction influences event activity. Figure one is a schematic of a SCAMP model. For the sake of simplicity, it omits differences in types of edge

SCAMP

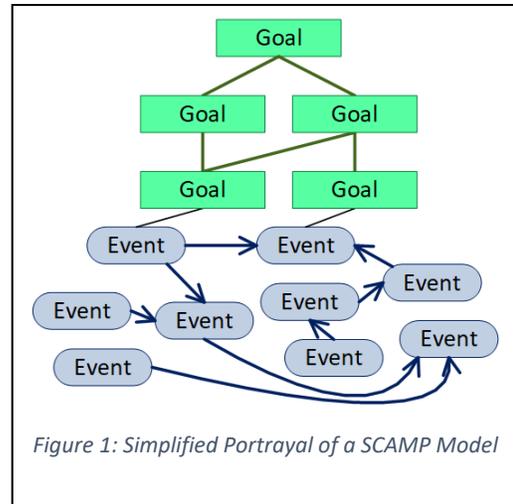
relationships, movement across space, and/or relationships among goals, and various other technical details that would be part of a fully-fledged SCAMP model.

Construction by domain experts, not programmers

SCAMP can be configured by domain experts with no formal programming training.

Example

Imagine an election scenario consisting of five types of agents: 1) advocates of position A, 2) advocates of position B, 3) conspiracy believers, 4) provocateurs, and 5) fact checkers. Based on their “personality”, agents move across events such as: “election is declared fraudulent”, “incumbent accepts defeat”, “extremist groups merge”, “political establishment accepts result”, “supporting and opposing groups clash in city X”, “clashes spreads”, and “violence decreases”. A goal hierarchy for say, fact checkers might culminate with “population accepts fact checkers’ assessments”, supported by a variety of sub-goals.



A SCAMP simulation run would reveal agents’ movements across events, goal satisfaction, and mutual influences between event activation and goal satisfaction. Thus, SCAMP could address questions such as: Under what circumstances will fact checkers and advocates of a specific political position affiliated with each other? Or, if such an affiliation takes place, will each group attain more of its goals? These are network-based questions that have both real-world salience and theoretical implications for understanding political behavior, neither of which could be addressed using traditional network approaches.

SCAMP was developed with DARPA funding under their [Ground Truth](#) program. The prime contractor was [Parallax Advanced Research](#).

For more information contact:

Van Parunak
van.parunak@gmail.com

Physics
Linguistics
Biology

ABC Research, LLC

Jonny Morell
jamorell@jamorell.com

4.669...
Evaluation & Planning