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Controlled, Large, Online Social Experiments: The CLOSE platform

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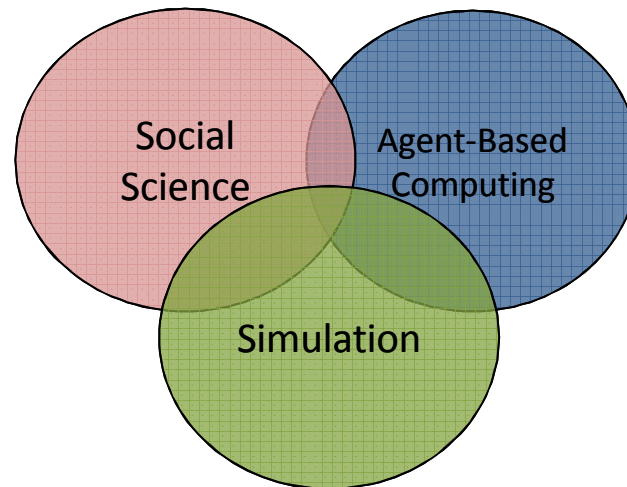
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Emerging Concerns for National Security



Agent based models (ABMs)

- Simulate interactions between autonomous agents to view the effect on the system
 - Applies elements of game theory, emergence, and complex systems
 - Social models include areas of psychology, sociology, and cognitive science
 - Agents can represent individuals, groups, or entire societies
- ABMs can provide insight on how populations would behave in a given scenario
 - Known applications include economics, epistemology, and information diffusion



How to improve ABMs?

- ABMs require real world examples of social behavior to *inform* and *validate* models
 - Difficult & time-consuming to obtain data
 - Data not always sufficient in fidelity or completeness
- Current methods:
 - Lab experiments: Small scale, lack subject diversity, expensive.
 - Surveys: Observation only; lack of temporal information, limited questions.
- Social media also not best source for data
 - Does not always provide link between what people say & what they do.
 - *The Waning Appeal of the Radical Sheik* (Haykell, 2011)



Lab Experiments



- Positives:
 - Tightly controlled
 - Explicit testing of hypotheses
- Limits:
 - Small Scale (by subjects and by time)
 - Lack of subject diversity (Sears, 1986)

Observational Studies



- Positives:
 - Large scale (by subject)
 - Increased subject diversity
- Limits:
 - Observational only



Current Methods

Lab Experiments



Observational Studies



No single method is perfect – should use all three together.

Controlled, Large, Online Social Experiment(CLOSE)

New method of systematically testing social theories and models with a *diverse and large subject pool*, in an *online, temporally extended manner*.

Positives:

- Large scale
- Diverse subjects
- Online
- Repeatable

Limits:

- Online

Online nature allows:

- Scalability
- Diversity
- Repeatability



Subject chosen username and avatar.

Create RenderRound

LIFE

Home About Contact

User: lifedmin
Log out

Warning! This survey will close at the end of Jul 31, 2014

G4T5BY

Friend(s)

Conan

Panda

Clifford

Heathcliff

Panda

Brazil will win the World Cup

Why Brazil will win the world cup

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Instructions

Please read the article and answer the questions below.

1. In what year was Brazil's last loss at home?

Your Response:

2000

1950

2002

1975

2. Spain won the world cup tournament in 2010. Which team do you think will win the FIFA World Cup this year?

What did your friends say?

Conan said:

Brazil

Panda said:

Brazil

Your Response:

Brazil

USA

Germany

Spain

Submit

Article for this round.

Subject's friends chosen by experimenter. Names and images of friends also chosen by experimenter.

Subjects sees responses from their "friends".



2. Spain won the world cup tournament in 2010. Which team do you think will win the FIFA World Cup this year?

What did your friends say?



Conan said:

Brazil



Panda said:

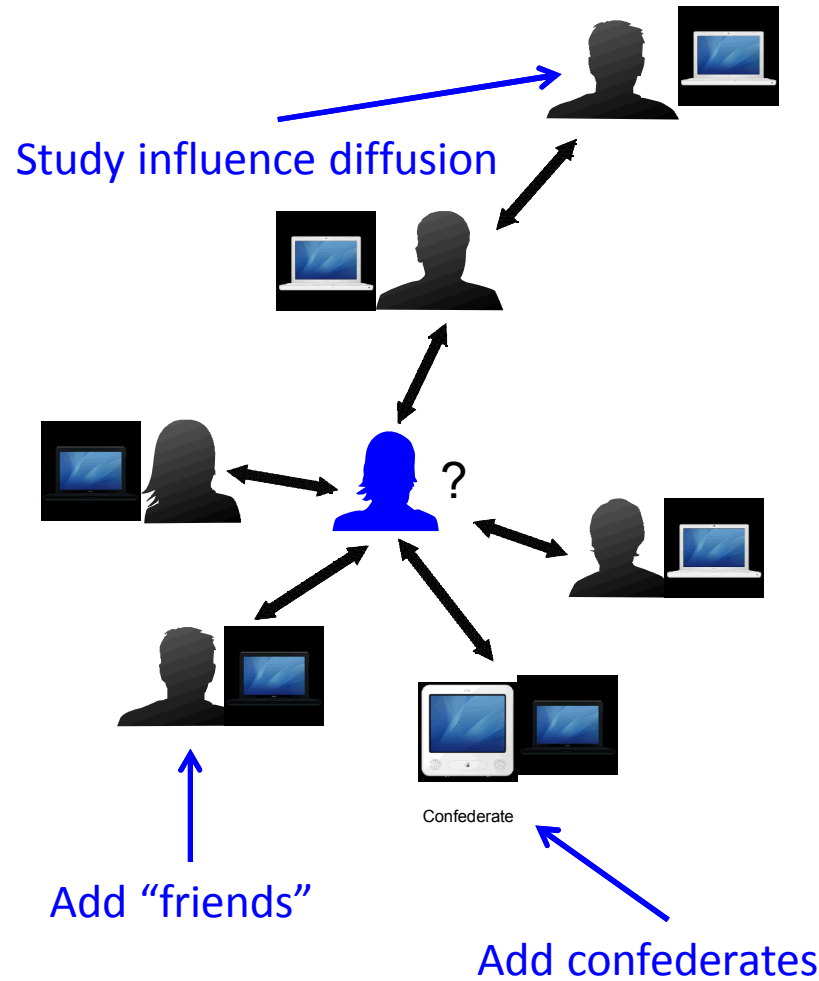
Brazil

Your Response:

- ☐ Brazil
- ☐ USA
- ☐ Germany
- ☐ Spain

Submit

Questions to study

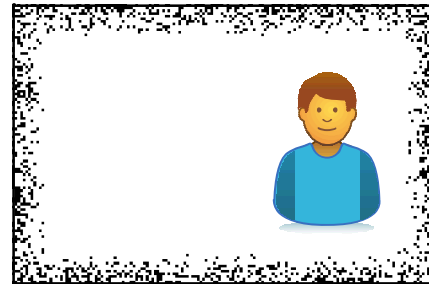
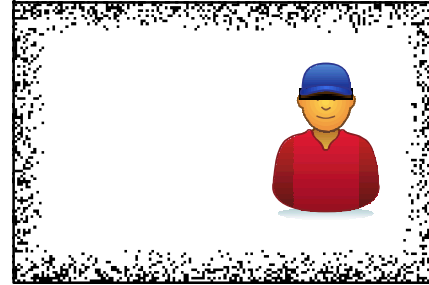
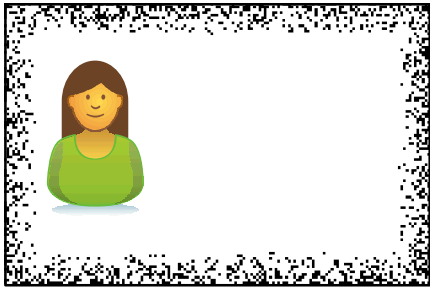


Questions to study

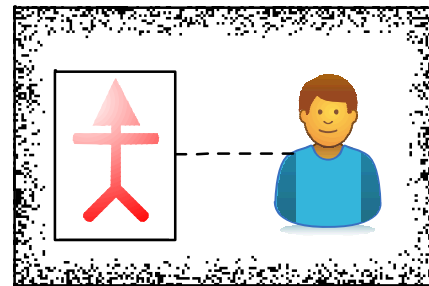
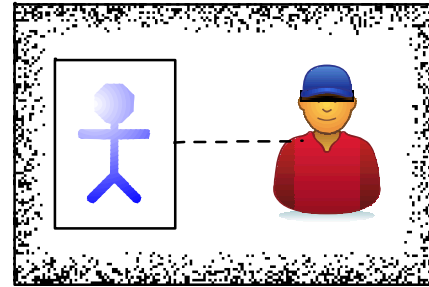
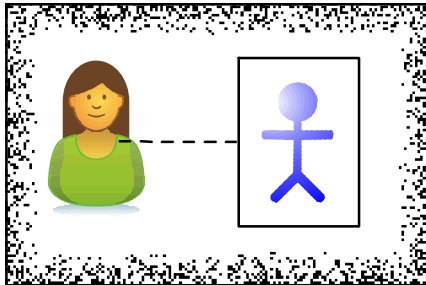
- Social influence
 - Behavior and attitude change.
- Influence of interaction networks on information and attitude diffusion.
- Influence of group identity on diffusion.
- Lead to data to help inform/calibrate/validate agent-based models.



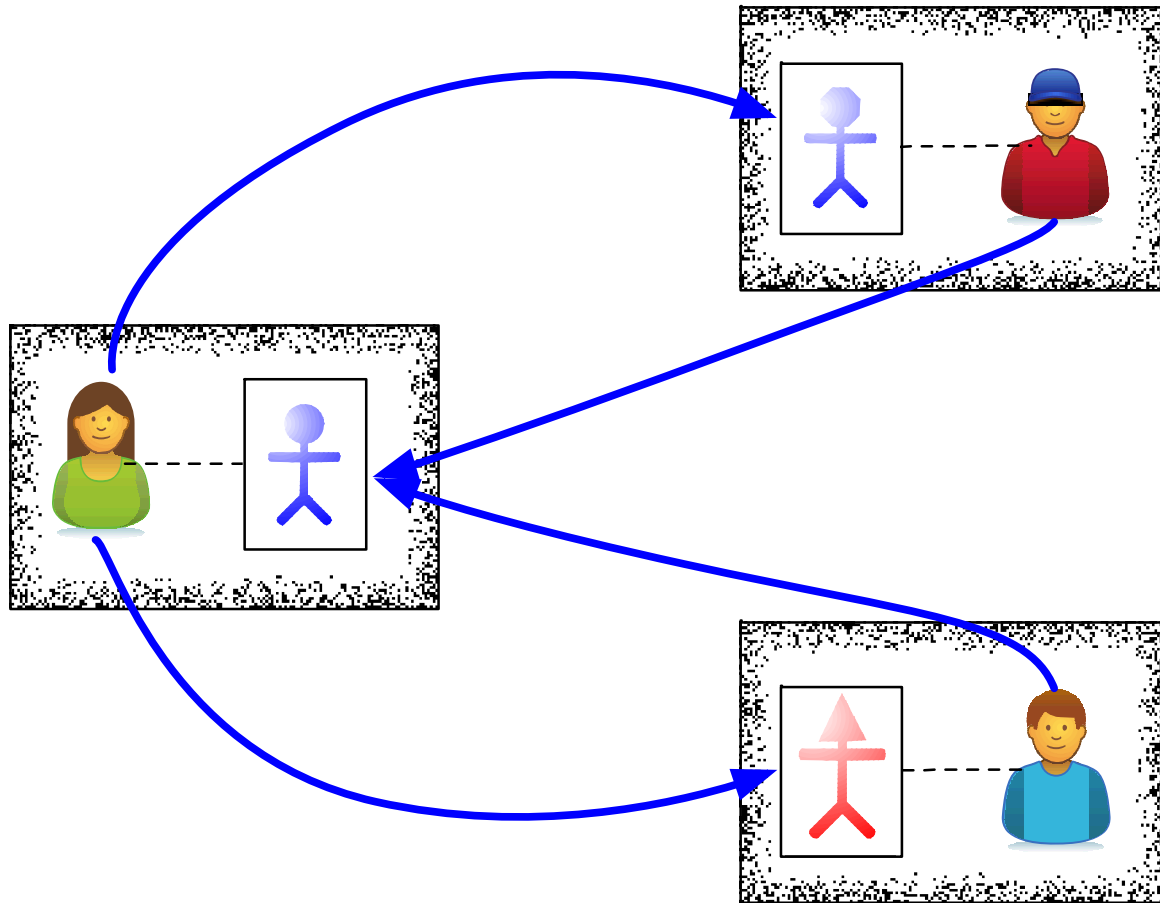
Avatar assignment



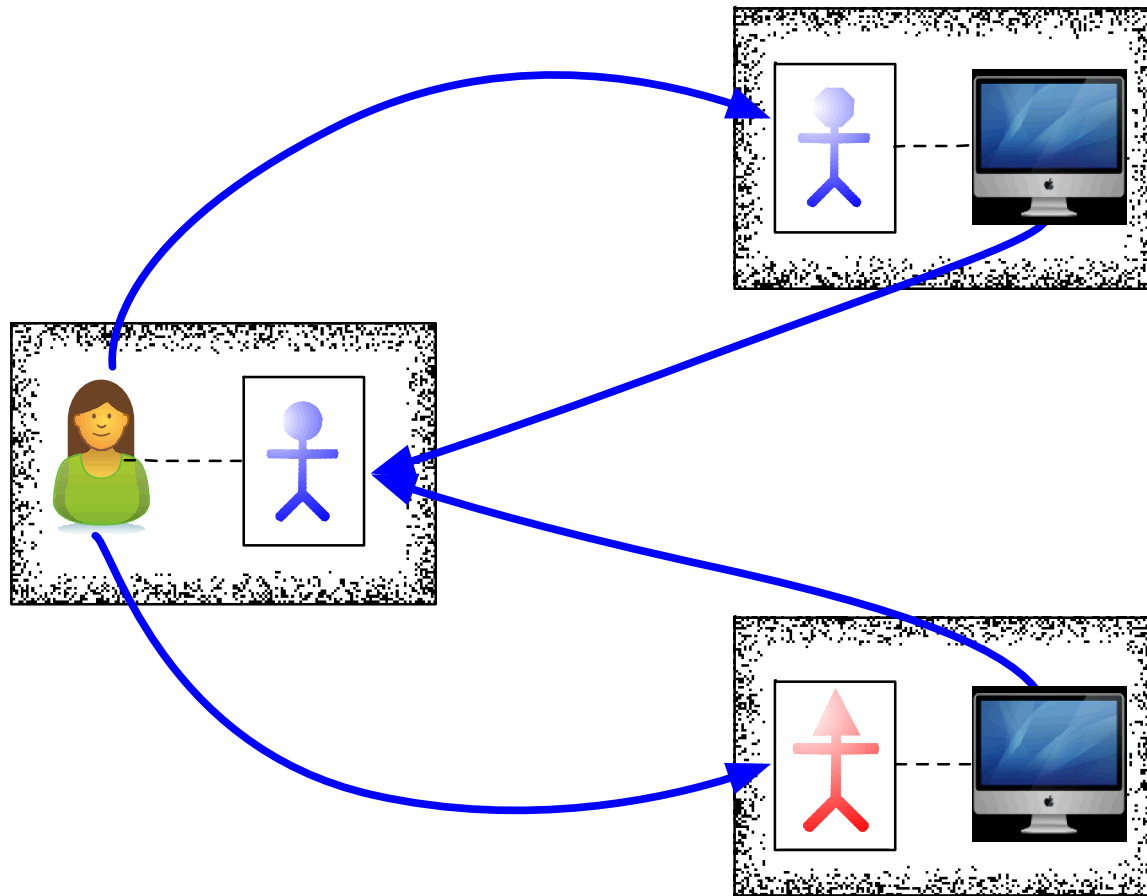
Avatar assignment



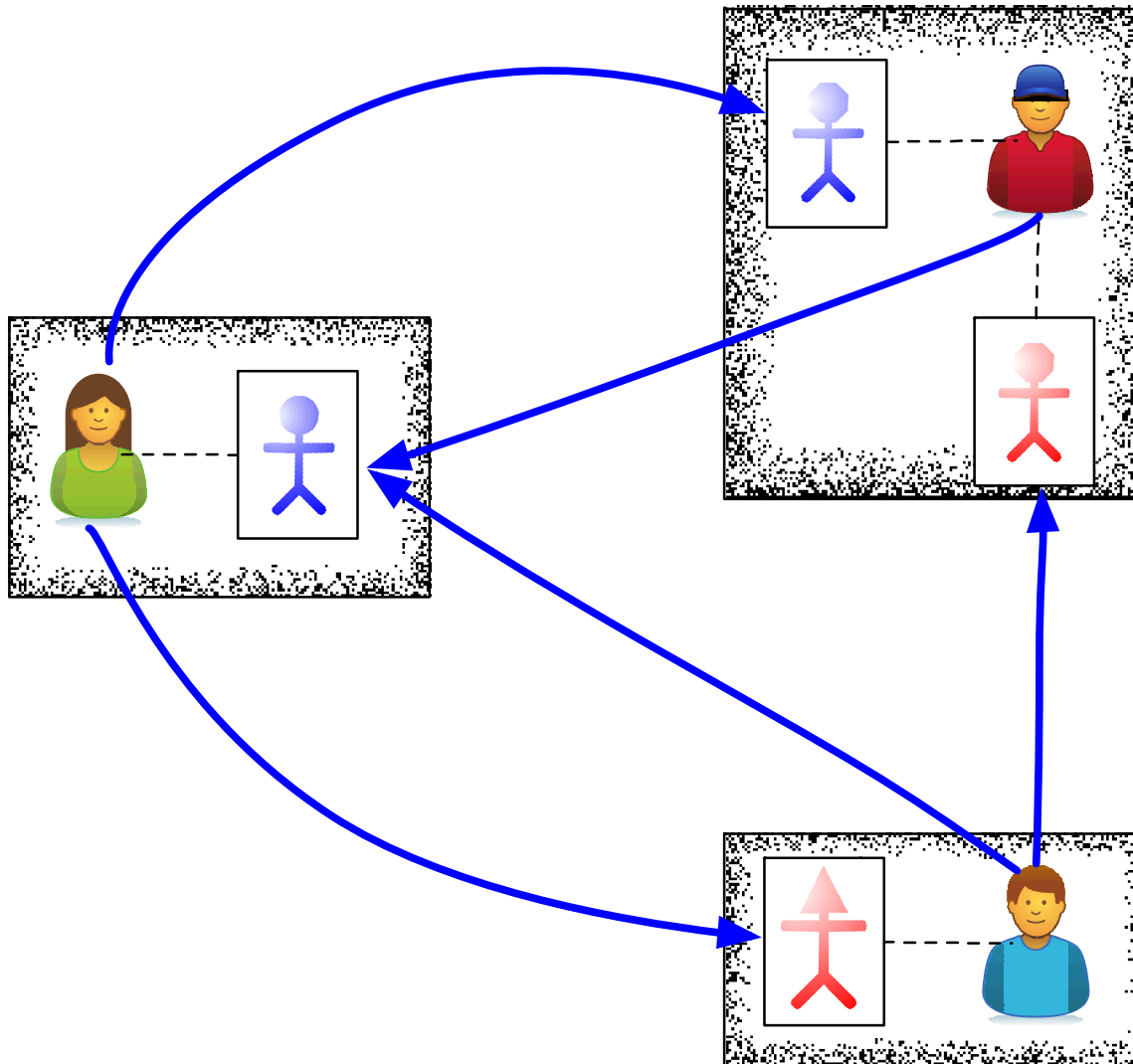
Avatar assignment



Avatar assignment – computer controlled



Avatar assignment – multiple avatars



Related work

- Historic examples of Asch work on social influence in Face-to-Face (FtF) work.
- Junghyung Kim's work on group identity and conformity in online settings:
 - Kim, 2009, 2010, 2011, and Kim & Park 2011
 - Manipulated similarity of group avatars in an online influence setting.
 - Testing on change in answers to a choice dilemma situations.
- Mason, Jones and Gladstone, 2008: work on diffusion of information in networked games
- Centola, 2010: Change in health related behavior.



Subject Pool

- Currently drawn from Amazon Mechanical Turk
 - Any subject pool from an online source can be chosen.



Will there be influence?

- An important question: Will there be influence between individuals?
- Several studies show that in CMC settings, random “friends” can influence a subject:
 - Centola, 2010: Buddies assigned in a health behavior setting.
 - Kim, 2009, 2010, 2011, and Kim & Park 2011: Instances of group conformity conditioned on group similarity.



Bibliography

- D. Centola. The spread of behavior in an online social network experiment. *Science*, 329:1194, 3 September 2010.
- J. Kim. “i want to be different from others in cyberspace” the role of visual similarity in virtual group identity. *Computers in Human Behavior*, 25(1):88–95, Jan. 2009.
- J. Kim. Balancing uniqueness and assimilation in computer-mediated groups. *Computers in Human Behavior*, 26(4):778–784, July 2010.
- J. Kim. Two routes leading to conformity intention in computer-mediated groups: Matching versus mismatching virtual representations. *Journal of Computer-Mediated Communication*, 16(2):271–287, Jan. 2011.
- J. Kim and H. S. Park. The effect of uniform virtual appearance on conformity intention: Social identity model of deindividuation effects and optimal distinctiveness theory. *Computers in Human Behavior*, 27(3):1223–1230, May 2011.
- W. A. Mason, A. Jones, and R. L. Goldstone. Propagation of innovations in networked groups. *Journal of Experimental Psychology: General*, 137(3):422–433, 2008.
- D. O. Sears. College sophomores in the laboratory: Influence of a narrow data base on social psychology’s view of human nature. *Journal of Personality and Social Psychology*, 51(3):515–530, 1986.

