

# eScholarship@UMassChan

## Health Applications of Network Science and Computational Social Science

|               |   |
|---------------|---|
| Item Type     | Poster Abstract   |
| Authors       | Kitts, James A.   |
| DOI           | <a href="https://doi.org/10.13028/3h2z-9x56">10.13028/3h2z-9x56</a>   |
| Rights        | Copyright the Author(s)   |
| Download date | 2024-12-30 22:33:23   |
| Item License  | <a href="http://creativecommons.org/licenses/by-nc-sa/3.0/">http://creativecommons.org/licenses/by-nc-sa/3.0/</a> |
| Link to Item  | <a href="https://hdl.handle.net/20.500.14038/28193">https://hdl.handle.net/20.500.14038/28193</a>                 |

## HEALTH APPLICATIONS OF NETWORK SCIENCE AND COMPUTATIONAL SOCIAL SCIENCE

James A. Kitts, PhD

Computational Social Science Institute, Department of Sociology, University of Massachusetts Amherst

Social network analysis has proliferated rapidly across the social and behavioral sciences, with increasingly apparent implications for human health. Shifting our focus from individuals to the patterns of social ties that connect them has enriched our understanding of a great variety of health-related phenomena, including the spread of STDs on contact networks, the spread of health care practices on practitioners' professional networks, the dynamics of patient transfers on networks of clinics, and the spread of health behaviors on adolescent friendship networks. The advent of *computational social science* has augmented such contributions by introducing scalable methods of automatically monitoring and rigorously modeling these phenomena. Sample applications include analysis of electronic health records and other time-stamped communication traces among health care practitioners; streams of behavioral and biometric data from wearable sensors, location-aware devices, or electronic calendars; automated analysis of text in documents using natural language processing; and mapping networks of scientific collaboration by citations and co-authorships in clinical research literatures. Whereas much work in computational social science has offered new ways of empirically monitoring health behavior and health care behavior, a further contribution has been to directly model these social processes using system dynamics, microsimulation, discrete event simulation, and agent-based models. These approaches allow for computational 'virtual' experiments that assist in predicting, interpreting, and evaluating outcomes from health interventions. This poster will highlight some of my recent and pending work in this broad domain, aiming to identify potential collaborators in UMCCTS for projects that involve social networks or computational social science.

### **Contact:**

James A. Kitts, PhD

Director, Computational Social Science Institute

Professor, Department of Sociology

University of Massachusetts Amherst

[jkitts@umass.edu](mailto:jkitts@umass.edu)