

# Kenneth Joseph

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## Education

<b>Ph.D.</b>	Societal Computing	Carnegie Mellon University	June 2016, expected
<b>M.S.</b>	Societal Computing	Carnegie Mellon University	2012
<b>B.S.</b>	Computer Science	University of Michigan-Ann Arbor	2010

**Thesis:** “Latent Cognitive Social Spaces: theory and methods for extracting prejudice from text”.

*Committee Members:* Kathleen Carley (SI, CMU; Chair), Jason Hong (HCII, CMU), Lynn Smith-Lovin (Sociology, Duke), Eric Xing (ML/LTI, CMU)

## Publications

### Journal

Wei, W., **Joseph, K.** & Carley, K.M. (accepted). Exploring Characteristics of Suspended Users and Network Stability on Twitter. *Social Network Analysis and Mining*.

Gunturi, V.M.V., Shekhar, S., **Joseph, K.** & Carley, K.M. (accepted). Scalable Computational Techniques for Centrality Metrics on Temporally Detailed Social Networks. *Machine Learning*.

**Joseph, K.**, Wei, W. & Benigni, M. & Carley, K.M. (2016). A social-event based approach to sentiment analysis of identities and behaviors in text. *Journal of Mathematical Sociology*. 1–30.

**Joseph, K.**, Carley, K. M., Filonuk, D., Morgan, G. P., & Pfeffer, J. (2014). Arab Spring: from newspaper data to forecasting. *Social Network Analysis and Mining*, 4(1), 1–17.

**Joseph, K.**, Carley, K. M., & Hong, J. I. (2014). Check-ins in “Blau Space”: Applying Blau’s Macrosociological Theory to Foursquare Check-ins from New York City. *ACM Transactions on Intelligent Systems and Technology*, 5(3), 46:1–46:22.

**Joseph, K.**, Morgan, G. P., Martin, M. K., & Carley, K. M. (2014). On the Coevolution of Stereotype, Culture, and Social Relationships: An Agent-Based Model. In “*Social interaction- the bridge between micro and macro*” *Social Science Computer Review* ed. Bruce Edmonds and Flaminio Squazzoni. 32(3), 295–311.

### Conference

Carton, S.\*, Helsby, J.\*, **Joseph, K.\***, Mahmud, A.\*, Park, Y.\*, Walsh, J., Haynes, L., Cody, C., Patterson, E., Ghani, R. (2016). A Model for Improved Early Intervention to Reduce Adverse Police-Public Interactions. *KDD (Applied Track)*. \* - Equal contributions

- Joseph, K.**, Wei, W. & Carley, K.M. (2016). Exploring patterns of identity usage in tweets: a new problem, solution and case study on Ferguson. *WWW 2016*.
- Frankenstein, W., **Joseph, K.** & Carley, K.M. (2016). Contextualized Sentiment Analysis. *SBP 2016*
- Wei, W., **Joseph, K.**, Liu, H. & Carley, K.M. (2015). The Fragility of Twitter Social Networks Against Suspended Users. *ASONAM 2015*.
- Wei, W., **Joseph, K.**, Lo, W. & Carley, K.M. (2015). A Bayesian Graphical Model to Discover Latent Events from Twitter. *ICWSM 2015*.
- Joseph, K.** & Carley, K.M. (2015). Culture, Networks, Twitter and foursquare: Testing a Model of Cultural Conversion with Social Media Data. *ICWSM 2015. Short paper*
- Morgan, G.M., **Joseph, K.** & Carley, K.M. (2015). Group-Based Transactive Memory to implement Computationally-Plausible Social Cognition in Agents. *BRiMS 2015*.
- Lorince, J., **Joseph, K.** & Todd, P. (2015). Analysis of music tagging and listening patterns: Do tags really function as retrieval aids? *SBP 2015*.
- Joseph, K.**, Landwehr, P.M. & Carley, K.M. (2014). Two 1% don't make a whole: Comparing simultaneous samples from Twitter's Streaming API. *SBP 2014*.
- Joseph, K.**, Landwehr, P.M. & Carley, K.M. (2014). An Approach to Selecting Keywords to Track on Twitter During a Disaster. *ISCRAM 2014*.
- Joseph, K.**, Wei, W. & Carley, K.M. (2013). An Agent-Based Model for Simultaneous Phone and SMS Traffic Over Time. *SBP 2013*.

## Workshops and Book Chapters

- Joseph, K.**, Tan, C.H. & Carley, K.M. (2012). Beyond "Local", "Social" and "Category": Clustering foursquare Users Using Latent "Topics". *LBSN 2012, Workshop at UbiComp 2012*.
- Joseph, K.**, Jose, R. & Carley, K.M. (2012). Leveraging Media Repertoires to Create New Social Ties. *SOTFTec 2012, Workshop at UbiComp 2012*.
- Carley, K.M., Wei, W. & **Joseph, K.** (2015). High Dimensional Network Analysis. In "Big Data Over Networks", Robert Cui (Eds). Cambridge University Press.

## Working Papers

- Joseph, K.**, Wei, W., & Carley, K.M. (in submission). Girls rule, boys drool: Inferring semantic and affective relationships between identities from text. *CSCW*.
- Joseph, K.** & Carley, K.M. (in preparation). A socio-cognitive model of identity labeling. *American Sociological Review*.
- Wei, W., **Joseph, K.** & Carley, K.M. (in preparation). An Infinite, Dynamic, Correlated, Spatial Topic Model *WSDM*.
- Joseph, K.**, Benigni, M., Wei, W., Carley, K.M. & Bloom, M. (in submission). War or Adaptation? Arab Spring Stories in News and Twitter. *IEEE Transactions on Computational Social Systems*.
- Morgan, G.P., **Joseph, K.** & Carley, K.M. (in submission). The Power of Social Cognition. *Journal of Social Structure*.
- Benigni, M., **Joseph, K.** & Carley, K.M. (in submission). Covert Network Detection in Social Media: Uncovering the ISIS Supporting Network on Twitter. *PLOS One*.

## Tutorials

Fred Morstatter, **Joseph, K.** & Sumeet Kumar. Exploring Public Events Using Social Media Data: Challenges in Extraction, Modeling and Analyzing. SBP 2016.

## Posters and Conference Presentations

**Joseph, K.** What can('t) data science do to prevent adverse police incidents? (2016). *Data Science for Social Good Conference*. Chicago, IL.

**Joseph, K.** Carton, S., Mahmud, A., Park, Y., Walsh, J., Haynes, L., Helsby, Cody, C., Patterson, E., Ghani, R. (2016). A Model for Improved Early Intervention to Reduce Adverse Police-Public Interactions. *IC<sup>2</sup>S<sup>2</sup>*. Chicago, IL

**Joseph, K.** & Carley, K.M. (2016). Latent Cognitive Social Spaces: Theory and Methods for Extracting Prejudice from Text *Sunbelt 2016*. Newport Beach, CA.

**Joseph, K.** & Carley, K.M. (2015). A social-event based approach to sentiment analysis of identities and behaviors in text. *ASA 2015*. Chicago, IL.

**Joseph, K.** & Carley, K.M. (2015). Culture, Networks, Twitter and foursquare: Testing a model of cultural conversion using social media data. *Computational Social Science Summit (CSSS 2015)*. Northwestern University, Chicago, IL.

**Joseph, K.** & Carley, K. M. (2012). Quantifying Meaning in Interaction on Different Communication Media. *INSNA Sunbelt Conference*. Ft. Myers, FL.

**Joseph, K.**, Landwehr, P. M. & Carley, K. M. (2012). Using the Crowd to Mine the Crowd: Combining Ushahidi and Twitter Data from the Haitian Earthquake of 2010. *InfoSocial 2012*. Northwestern University, Chicago, IL.

McGhee-Hassrick, E., Carley, K.M, **Joseph, K.** & Leventhal, B. (2014). Can Reconfigured Schools Improve Disparities in Autism Treatments? *Conference on Complex Systems, Health Disparities & Population Health: Building Bridges*. Bethesda, MD.

Lorince, J., **Joseph, K.**, & Todd, P. M. (2015). Do tags really function as retrieval aids? *International Conference on Computational Social Science (IC<sup>2</sup>S<sup>2</sup> 2015)*. Helsinki, Finland.

## Technical Reports

**Joseph, K.** & Carley, K.M. (2012). Simulating Diffusion with Conflicting Knowledge. *Carnegie Mellon University, School of Computer Science, Institute for Software Research, Technical Report, CMU-ISR-12-111*.

Carley, K.M., Filonuk, D.T., **Joseph, K.**, Kowalchuck, M., Lanham, M.J. & Morgan, G.P. (2012). Construct User Guide. *Carnegie Mellon University, School of Computer Science, Institute for Software Research Technical Report, CMU-ISR-12-112*.

Gunturi, V.M.V., **Joseph, K.**, Shekhar, S. & Carley, K.M. (2012). Information lifetime aware analysis for dynamic social networks. *University of Minnesota, Department of Computer Science Technical Report, TR 12-023*.

Martin, M.K., Morgan, G.P, **Joseph, K.** & Carley, K.M. (2010). Impact of Information Loss and Information Error on Network-enabled Decision-making. *Carnegie Mellon University, School of Computer Science, Institute for Software Research Technical Report, CMU-ISR-10-127*.

## Other Research-related Talks

“Tutorial on text mining”. (2015). *Fellow teach-out, Data Science for Social Good fellowship*. Chicago, IL, USA.

“Modeling the Coevolution and Coexistence of Stereotypes, Prejudices and Socio-cultural Structure”. (2014). *CMU Machine Learning and Social Science Seminar*. Pittsburgh, PA

## Non-Peer Reviewed

[http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=display&article\\_id=4228&issue\\_id=82016](http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=display&article_id=4228&issue_id=82016)

## Awards and Distinctions

**CMU Gelfand Student Service Award.** (2015). “Presented to students who share time, talent, energy and a passion for learning to make a difference for members of the external community.”

**Data Science for Social Good fellow** (2015). Worked on a project entitled “Early Warning Indicators for Adverse Police Interactions” (<http://dssg.uchicago.edu/2000/03/09/org-police.html>; Popular press coverage including ChicagoInno; 9/1/15, WBEZ Chicago; 8/21/15; White House blog 10/27/15; fivethirtyeight 3/9/16)

**Winner, Datathon for Computational Social Science Summit.** (2015). Replication code at [https://github.com/kennyjoseph/csss15\\_datathon](https://github.com/kennyjoseph/csss15_datathon)

**Best Paper Award**, for our paper “Beyond “Local”, “Social” and “Category”: Clustering foursquare Users Using Latent “Topics””. *LBSN 2012, Workshop at UbiComp 2012*

**GuSH-Crosswalk Interdisciplinary Grant.** (2014). For a project on Social Media Sentiment Analysis coding (\$1,000).

**GuSH Grant.** (2014). For a project on Identity Labeling (\$750).

**Graduate Student Assembly Travel Grant.** (2014,2015). To travel to the American Sociological Association’s Annual Conference (\$1000 total).

**SBP Conference Student Travel Grant.** (2013, 2014, 2015). Travel funding for presenters and conference committee members (\$900 total).

## Teaching

**Teaching Assistant - Spring 2015 and Sprint 2013** - for a graduate course on Dynamic Network Analysis

**Teaching Assistant - June 2011-2016** - for the CASOS Summer Institute, an intensive, week-long course on network analysis, text mining and agent-based simulation

## Service

### Professional

**Reviewer** for Social, Behavioral Prediction Conference (SBP 2014, 2015, 2016), Journal of Computational Management and Organizational Theory, IEEE Transactions on Computational Social Systems, Journal on

Social Network Analysis and Mining, ACM Transactions on Intelligent Systems and Technology, American Sociological Review

**Co-organizer, SBP'15 Grand Data Challenge.** The challenge focused on the question: “how can we use publicly available data on the web and elsewhere to find social inequality and to aid the disadvantaged?” (<http://sbp-conference.org/sbp2015/challenge/>)

**Co-organizer, SBP'16 Grand Data Challenge.** The challenge focused on the use of Event-based datasets (e.g. GDELT, Phoenix) to answer a question of social and/or technical implications (<http://sbp-brims.org/2016/challenge/index.html>)

## Outreach at CMU

**Outreach coordinator for SCS4ALL.** (2012-2014). SCS4ALL ([scs4all.cs.cmu.edu](http://scs4all.cs.cmu.edu)) is a computer science related outreach program promoting equality in the field.

**Organizer, Head Instructor for the “Computational Thinking Activity”.** (2011-2015). Twice-per-week course taught at the Pittsburgh Science and Technology Academy. More information at [www.women.cs.cmu.edu/What/Outreach/adventures/](http://www.women.cs.cmu.edu/What/Outreach/adventures/)

**“Bias Busters” instructor.** (2015). Lead sessions to spread information throughout the School of Computer Science at CMU about how unconscious bias effects decision making.

**Instructor, workshop for Deaf/Hard of Hearing** (2012). Day-long workshop using Gamemaker for Deaf/Hard of Hearing high school students.

**Instructor, CS4HS** (2013). Taught two hour-long sessions on visual programming using Google’s Blockly language.

## Technical Skills

### Languages:

Extensive Knowledge: C++, C, Java, Python (incl. Cython), R, “Android”

Working Knowledge: Javascript, HTML/CSS, Swift

Have Used for Teaching: R, Python, Blockly, Alice, Arduino

**“Tools”:** MySQL, PostgreSQL, MongoDB, Apache Spark, Hadoop, IPython

**Methods:** Bayesian methods, agent-based modeling, social network analysis, latent-space network modeling