

# Fred Morstatter

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## Professional Experience

**Information Sciences Institute, University of Southern California**  
*Computer Scientist*

Marina Del Rey, CA  
*July 2017 - Present*

## Education

**Arizona State University**  
*PhD in Computer Science*

Tempe, AZ  
*August 2011 - June 2017*

*Bachelor of Science in Computer Science*

*August 2007 - May 2011*

## Publications

### Books

1. Shamanth Kumar, **Fred Morstatter**, and Huan Liu. *Twitter Data Analytics*. Springer, 2014.

### Journal Publications

1. **Fred Morstatter**, and Huan Liu. *Measuring the Interpretability of Statistical Topics: In Search of Coherence and Consensus*, Journal of Machine Learning Research. *Forthcoming*.
2. **Fred Morstatter**, Liang Wu, Uraz Yavanoglu, Stephen S. Corman, and Huan Liu. *Identifying Framing Bias in Online News*, ACM Transactions on Social Computing. *Forthcoming*.
3. **Fred Morstatter**, and Huan Liu. *Discovering and Mitigating Data Collection Bias in Social Media*, Elsevier Journal on Online Social Networks and Media. June 2017.
4. **Fred Morstatter**, Huan Liu. *Replacing Mechanical Turkers? How to Evaluate Learning Results with Semantic Properties*, Journal of Data and Information Quality, Challenge Papers. October 2016.
5. Huan Liu, **Fred Morstatter**, Jiliang Tang, and Reza Zafarani. *The Good, The Bad, The Ugly: Uncovering Novel Research Opportunities in Social Media Mining*, Journal of Data Science and Analytics. September 2016.
6. **Fred Morstatter**, Huiji Gao, Huan Liu. *Discovering Location Information in Social Media*, IEEE Data Engineering Bulletin Special Issue on Location-based Social Media Analysis. June 2015.
7. Dror Y. Kenett, **Fred Morstatter**, H. Eugene Stanley, and Huan Liu. *Discovering Social Events through Online Attention*. PLoS ONE. July 2014.
8. Kathleen M. Carley, Jürgen Pfeffer, **Fred Morstatter**, and Huan Liu. *Embassies burning: toward a near-real-time assessment of social media using geo-temporal dynamic network analytics*. Social Network Analysis and Mining. April 2014.

### Refereed Full-Paper Conference Papers

1. Liang Wu, Jundong Li, **Fred Morstatter**, and Huan Liu. *Toward Relational Learning with Misinformation*. SIAM Conference on Data Mining (SDM), 2018. To appear.

2. Liang Wu, Xia Hu, **Fred Morstatter**, and Huan Liu. *Detecting Camouflaged Content Polluters*. International Conference on Weblogs and Social Media (ICWSM), 2017. 10 pages.
3. Liang Wu, Xia Hu, **Fred Morstatter**, and Huan Liu. *Adaptive Spammer Detection with Sparse Group Modeling*. International Conference on Weblogs and Social Media (ICWSM), 2017. 10 pages.
4. Suhang Wang, Jiliang Tang, **Fred Morstatter**, and Huan Liu. *Paired Restricted Boltzmann Machine for Linked Data*. Conference on Information and Knowledge Management (CIKM), 2016. 10 pages.
5. **Fred Morstatter**, Liang Wu, Tahora Hossein Nazer, Kathleen M. Carley, and Huan Liu. *A New Approach to Bot Detection: The Importance of Recall*. Advances in Social Networks Analysis and Mining (ASONAM), 2016. 8 pages.
6. **Fred Morstatter**, Jürgen Pfeffer, Katja Mayer, and Huan Liu. *Text, Topics, and Turkers: A Consensus Measure for Statistical Topics*. ACM Hypertext (HT), September 2015. Pages 123-131.
7. Justin Sampson, **Fred Morstatter**, Ross Maciejewski, and Huan Liu. *Surpassing the Limit: Keyword Clustering to Improve Twitter Sample Coverage*. ACM Hypertext (HT), September 2015. Pages 237-245.
8. **Fred Morstatter**, Jürgen Pfeffer, Huan Liu, and Kathleen M. Carley. *Is the Sample Good Enough? Comparing Data from Twitter's Streaming API with Twitter's Firehose*. International Conference on Weblogs and Social Media (ICWSM), July 2013. Pages 400-408.
9. Kathleen M. Carley, Jürgen Pfeffer, Huan Liu, **Fred Morstatter**, and Rebecca Goolsby. *Near Real Time Assessment of Social Media Using Geo-Temporal Network Analytics*. Advances in Social Networks Analysis and Mining (ASONAM) 2013. Pages 517-524.
10. Shamanth Kumar, **Fred Morstatter**, Reza Zafarani, and Huan Liu. *Whom Should I Follow? Identifying Relevant Users in Crisis*. Hypertext (HT) 2013. Pages 139-147.
11. Nambiar, Ullas and Faruque, Tanveer and Kumar, Shamanth and **Morstatter, Fred** and Liu, Huan, *Faceted Browsing over Social Media*, International Conference on Big Data Analytics 2012. Pages 91-100.
12. **Fred Morstatter**, Huan Liu, and Daniel Zeng. *Opening Doors to Sharing Social Media Data*, IEEE Intelligent Systems Magazine, January/February 2012. Pages 47-51.
13. Pui Cheong Gabriel Fung, **Fred Morstatter**, Huan Liu. *Feature Selection Strategy in Text Classification*, Pacific-Asia Conference on Advances in Knowledge Discovery and Data Mining (PAKDD), 2011. Pages 26-37.

## Book Chapters

1. Liang Wu, **Fred Morstatter**, Xia Hu, and Huan Liu. *Mining Misinformation in Social Media. Big Data in Complex and Social Networks*, CRC Press, Taylor & Francis Group, 2015.
2. Shamanth Kumar, **Fred Morstatter**, and Huan Liu. *Analyzing Twitter Data. Twitter: A Digital Socioscope*, Cambridge University Press, 2015.

## Refereed Demo Papers, Short Papers, and Extended Abstracts

1. Majid Alfifi, Parisa Kaghazgaran, James Caverlee, and **Fred Morstatter**. *Measuring the Impact of ISIS Social Media Strategy*, Misinformation and Misbehavior Mining on the Web (colocated with WSDM), 2018.
2. **Fred Morstatter**, Robert P. Trevino, and Huan Liu. *Characterizing and Identifying Skills in Social Media*, SBP-BRiMS, 2017.

3. Tahora H. Nazer, **Fred Morstatter**, Gareth Tyson, and Huan Liu. *A Close Look at Tinder Bots*, Women in Data Science Workshop in conjunction with SIAM International Conference on Data Mining, 2017.
4. Justin Sampson, **Fred Morstatter**, Liang Wu, and Huan Liu. *Leveraging the Implicit Structure within Social Media for Emergent Rumor Detection*, Conference on Information and Knowledge Management (CIKM), 2016. 6 pages.
5. Tahora H. Nazer, **Fred Morstatter**, Harsh Dani, and Huan Liu. *Finding Requests in Social Media for Disaster Relief*. International Conference on Advances in Social Networks Analysis and Mining (ASONAM), 2016. 4 pages.
6. **Fred Morstatter**, Huan Liu. *A Novel Measure for Coherence in Statistical Topic Models*, Association of Computational Linguistics (ACL), 2016. Pages 543-548.
7. **Fred Morstatter**, Harsh Dani, Justin Sampson, Huan Liu. *Can One Tamper with the Sample API? Toward Neutralizing Bias from Spam and Bot Content*, International World Wide Web Conference (WWW), 2016. Pages 81-82. **Best Poster Award: WWW 2016.**
8. Justin Sampson, **Fred Morstatter**, Reza Zafarani, Huan Liu. *Real-Time Crisis Mapping using Language Distribution*, International Conference on Data Mining (ICDM), 2015. Pages 1648-1651.
9. Harsh Dani, **Fred Morstatter**, Xia Hu, Zhen Yang, Huan Liu. *Social Answer: A System for Finding Appropriate Sites for Questions in Social Media*, International Conference on Data Mining (ICDM), 2015. Pages 1632-1635.
10. **Fred Morstatter**, Jürgen Pfeffer, and Huan Liu. *When is it Biased? Assessing the Representativeness of Twitter's Streaming API*. International World Wide Web Conference (WWW), 2014. Pages 555-556.
11. **Fred Morstatter**, Shamanth Kumar, Joshua Stiefer, Justin Sampson, Daniel Howe, Grant Marshall, David Kahn, Terrance Williams, Wesley Bowman, and Huan Liu. *CrisisTracker: Connecting First Responders to Twitter Analysis*. IEEE Global Humanitarian Technology Conference (GHTC) 2014.
12. **Fred Morstatter**, Nichola Lubold, Heather Pon-Barry, Jürgen Pfeffer, and Huan Liu. *Finding Eyewitness Tweets During Crises*. ACL Workshop on Language Technology and Computational Social Science, 2014. Pages 23-27.
13. **Fred Morstatter**, Shamanth Kumar, Huan Liu, and Ross Maciejewski. *Understanding Twitter Data with TweetXplorer*. Knowledge Discovery and Data Mining (KDD), Chicago, Illinois, USA, August 11-14, 2013. Pages 1482-1485.
14. Shamanth Kumar, **Fred Morstatter**, Grant Marshall, Huan Liu, Ullas Nambiar. *Navigating Information Facets on Twitter*. Knowledge Discovery and Data Mining (KDD), Beijing, August 12-16, 2012. Pages 1548-1551.

## Tutorials

1. **Fred Morstatter**, and Huan Liu. *Social Data Bias in Machine Learning: Impact, Evaluation, and Correction* at AAI. San Francisco, California, USA. February 2017. Full capacity with 167 registrants.
2. Liang Wu, **Fred Morstatter**, and Huan Liu. *Misinformation in Social Media: Diffusion, Detection and Intervention* at Social Computing, Behavioral-Cultural Modeling, & Prediction (SBP). Washington, DC, USA. June 2016.
3. **Fred Morstatter**, Kenneth Joseph, and Sumeet Kumar. *Challenges in Detecting Events with Social Media Data: Collecting, Modeling, and Exploring* at Social Computing, Behavioral-Cultural Modeling, & Prediction (SBP). Washington, DC, USA. June, 2016.

4. **Fred Morstatter**, Kathleen M. Carley, and Huan Liu. *Bot Detection in Social Media: Networks, Behavior, and Evaluation* at Advances in Social Networks Analysis and Mining. Paris, France. August, 2015.

## Invited Talks

1. *Bias and Misinformation in Online Social Networks* at Arizona State University Faculty Emeriti Luncheon. Tempe, Arizona, USA. May, 2017.
2. *Using Biased Social Samples for Disaster Response* at International Workshop on Collaborative Internet Computing for Disaster Management. Pittsburgh, Pennsylvania, USA. November 2016.
3. *An Unbiased Sample or a Spammer's Paradise? Understanding the Implications of Sampling Strategies in Social Media* at NSF Data Science Workshop hosted by University of Washington. Seattle, Washington, USA. August 2016.
4. *Discovering and Mitigating Bias in Social Media* at Technical University of Munich / Bavarian School of Public Policy. Munich, Germany. August 2016.
5. *Detecting and Mitigating Bias in Social Media* at Johns Hopkins University Applied Physics Laboratory. Laurel, Maryland, USA. June 2016.
6. *New Directions in Mining Social Media* at Strategic Communications Center of Excellence. Riga, Latvia. April 2016.
7. *Bots, Botnets, and Bot Detection* at TIDE Sprint. Krakow, Poland. April 2016.
8. *Discovering Bias in Big Social Media Data* at NSF Data Science Workshop hosted by University of Washington. Seattle, Washington, USA. August 2015.
9. *Developing Novel Auxiliary Technologies for Crisis Tracking* at Office of Naval Research Annual Program Review hosted by Carnegie Mellon University. Pittsburgh, Pennsylvania, USA. July 2015.
10. *Applications and Challenges in Mining Social Media Data* at Iowa State University. Ames, Iowa, USA. May 2015.
11. *Twitter Data Analytics – Applications and Considerations for Studying Big Twitter Data* at Guilin University of Electronic Technology. Guilin, China. April 2014.
12. *Utilizing Big Social Media Data for Humanitarian Assistance and Disaster Relief* at National Institute of Standards and Technology. Gaithersburg, Maryland, USA. March 2014.
13. *Social Computing: Challenges in Research and Applications* at Seminar on Social Computing and Crisis in the New Information Age. With Huan Liu and Shamanth Kumar. Brussels, Belgium. October 2013.

## Conference Talks

1. Jürgen Pfeffer and **Fred Morstatter**. *Tackling User Bias in Social Media to Increase Prediction Validity of Political Opinions* at Sunbelt XXXVI Conference. Newport Beach, California, USA. April, 2016.
2. John Tawa, Jürgen Pfeffer, **Fred Morstatter**, and Rosalyn Negrón. *Effects of Resource Competition on Blacks' Whites' and Asians' Spatio-Temporal Interactions* at Sunbelt XXXIV Conference. St. Petersburg, Florida, USA. February, 2014.

## Teaching

- Fall 2016 CSE 691 - Advanced Social Media Mining: Invited Lecture on “Detecting and Mitigating Data Collection Bias in Online Social Networks”

**Fall 2016** FSE 294 - Undergraduate Research Experience: Invited Lecture on “What to Expect when Pursuing a Graduate Degree”

**Fall 2015** CSE 591 - Social Media Mining (co-taught)

**Fall 2015** FSE 294 - Undergraduate Research Experience: Invited Lecture on “Research from the Graduate Student Perspective”

## Service

### Journals

**2016 - 2017** Review Editor for Frontiers in Psychology, section Disaster Communications.

### Challenge Co-Chair

**2016** Social Computing, Behavioral Modeling, and Prediction (SBP).

**2015** Social Computing, Behavioral Modeling, and Prediction (SBP).

**2014** Social Computing, Behavioral Modeling, and Prediction (SBP).

### Program Committee Member

**2018** AAI International Conference on Weblogs and Social Media (ICWSM).

**2018** The Web Conference (formerly WWW).

**2018** ACM International Conference on Web Search and Data Mining (WSDM).

**2018** Heterogeneous Networks Analysis and Mining (HeteroNAM).

**2017** IEEE International Conference on Data Science and Advanced Analytics (DSAA).

**2017** AAI International Conference on Weblogs and Social Media (ICWSM).

**2016** AAI International Conference on Weblogs and Social Media (ICWSM).

**2015** Behavior Analysis, Modeling, and Steering (BEAMS).

**2014** AAI International Conference on Weblogs and Social Media (ICWSM).

**2014** IEEE/CIC ICCS Symposium on Social Networks and Big Data (SNBD).

### External Reviewer

**2017** AAI, TKDE, TCAG, TSC, JDIQ, OSNEM.

**2016** WWW, WSDM, AAI, IEEE Big Data, SNAM, TKDE.

**2015** WSDM, ICWSM, ICDM, IEEE TCSS.

**2014** WSDM, ECML/PKDD.

**2013** WWW, WSDM, TCAG.

**2012** WWW, KDD, PAKDD.

## Mentoring and Advice

### Undergraduate Thesis Committee Member

Honor's Thesis Second Reader, "Leveraging Social Media for Improved Prediction of Sports Betting Prices", Lew Ruskin, Spring 2017.

Honor's Thesis Second Reader, "Recommending Instagram Posts with Social and Image Cues", Kian Fakhri, Fall 2016.

Honor's Thesis Second Reader, "Categorizing and Discovering Social Bots", Mark Karlsrud, Spring 2015.

Honor's Thesis Second Reader, "Predicting Trends on Twitter with Time Series Analysis", Grant Marshall, Spring 2015.

### Research Mentor

Fulton Undergraduate Research Initiative (FURI) Mentor, "A Novel Data Repository for Bias Assessment in Social Media", J. Daniel Baird, Fall 2016.

FURI Mentor, "Harnessing Social Media Power in Finding Lost Pets—Developing a Mobile Geo-Spatial Tool", Lisa Baer, Spring 2014.

FURI Mentor, "Predicting Trends on Twitter Using Time Series and Social Network Information", Grant Marshall, Spring 2014.

FURI Mentor, "Navigating Information Facets on Twitter (NIF-T)", Grant Marshall, Spring 2012.

### Undergraduate Capstone Projects

"Augmenting Tweets with Expert Data for Crisis Response", August 2015 - May 2016.

"Harnessing the Power of Multimedia Social Networks", August 2014 - May 2015.

"CrisisTracker: Delivering Real Time Crisis Information to First Responders", August 2013 - May 2014.

### Other Undergraduate and High School Mentoring

High School Intern: Ricky Hsu, Summer 2016.

High School Interns: Daria Bazzi, Terry Wen & Soumya Kambhampati, Summer 2013.

Collection and Analysis of Microblog Data, Daniel Howe, Summer 2013.

Collection and Analysis of Microblog Data, Grant Marshall & Luke Pirtle, Summer 2012.

### Leadership

President of WCS, 2010-2011.

Organized Women in Computer Science at ASU (WCS) annual programming competition, 2010-2011.

Created ASU's first undergraduate tutoring center for first year Computer Science students in collaboration with two professors, 2010.

## Awards

### Awards and Honors

University Graduate Fellowship, 2017.

World Wide Web Conference, 2016, Montreal. Best Poster Award. Awarded to 1 of 72 accepted posters.

Presidents Award for Innovation, 2014—“Empowering Humanitarian Assistance and Disaster Relief with Social Media and Data Analytics”.

University Graduate Fellowship, 2016.

Dean’s Fellowship, May 2011 - Present.

Honorable Mention: Computing Research Association’s Outstanding Undergraduate Researcher Award, 2011.

### Travel Grants

ORAU Travel Grant to attend Heidelberg Laureate Forum, 2017.

SBP Student Travel Award, 2017.

ICWSM Travel Grant, 2017.

AAAI Travel Grant, 2017.

NSF Data Science Workshop Travel Grant, 2016.

ACL Volunteer Award, 2016.

ASU Faculty Emeriti Fellow, 2016-2017. Awarded to 10/150+ students who enrolled in Preparing Future Faculty in Fall 2016.

SBP Travel Grant, 2016.

Allstate Travel Grant, 2016.

Conference on Online Social Networks Travel Grant, 2015.

Hypertext Travel Grant, 2015.

NSF Data Science Workshop Travel Grant, 2015.

Technology Entrepreneurship Demo Day. Runner Up Winner for “Karma” Startup Project, 2015.

ACL Workshop on Language Technologies and Computational Social Science Travel Grant, 2014.

KDD Travel Grant, 2013.

ICWSM Travel Grant, 2013.

## Software Development

### Systems

**TweetXplorer** – <http://tweettracker.fulton.asu.edu/TweetXplorer/>.

**TweetTracker** – <http://tweettracker.fulton.asu.edu/>.

**CrisisTracker** – <http://tweettracker.fulton.asu.edu/CrisisTracker/user-guide.html>.

## **Intellectual Property Disclosures**

**D16-050** - Predicting Online Protest Participation in Social Media (2016)

**M16-049P** - Novel clustering algorithms for improved Twitter dataset creation (2015)

**M14-006P** - CrisisTracker: Mobile Social Media Dashboard for First Responders (2013)

**M13-133P** - TweetTracker Desktop: A Twitter Monitoring and Analysis Platform (2013)

**M13-067P** - TweetXplorer (2012)

**M12-077P** - TweetTracker Mobile (2011)

## **Other Professional Experience**

Research Intern, Microsoft Research. Mountain View, California. Fall 2014.

Visiting Scholar, Carnegie Mellon University. Pittsburgh, Pennsylvania. June 2014 - August 2014.

Summer Intern, Axosoft. Scottsdale, Arizona. May 2011 - August 2011.

Undergraduate Research Assistant, Arizona State University. Tempe, Arizona. November, 2009 - May, 2011.

College Student Technician Senior, Lockheed Martin. Goodyear, Arizona. May 2009 - May 2011.

Programmer, HBL Consultants. Akron, Ohio. September 2006 - January, 2009.

## **References**

Available Upon Request