Sumeet Kumar

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I am a Ph.D. candidate in the School of Computer Science at Carnegie Mellon. I am interested in research topics at the intersection of machine learning and network science. My current focus is on developing semi-supervised machine learning models that predict the stance of social-media users on controversial topics. I also explore social problems prevalent in social media, including the issues of misinformation and fake news.

In the past years, I have also conducted research in mobile-computing investigating the use of phone-sensors in emergencies to improve situational awareness. My team's study on the wireless-emergency-alerting service in the US addressed several issues of central importance to emergency alerts' effectiveness and adoption. The US Federal Communications Commission (FCC) used my team's research recommendations in its newly proposed improvements to the US wireless-emergency-alerting service.

Education

Ph.D. in Societal Computing, School of Computer Science, **Carnegie Mellon University**, Spring 2020 (Expected)
Expected Thesis Title: **Multi-Modal Semi-Supervised Stance Learning**
Committee Members: Dr. Katheen M. Carley, Dr. Tom Mitchell, Dr. LP Morency, Dr. Huan Liu
MS in Machine Learning**,** School of Computer Science, **Carnegie Mellon University**, Dec 2018
MS in Software Engineering - Carnegie Institute of Technology**, Carnegie Mellon University**, Aug 2013
B Tech in Aerospace Engineering – **Indian Institute of Technology Kanpur (IIT Kanpur)**, July 2007

Research in Progress

1. **Sumeet Kumar,** Tom Mitchell, Kathleen M. Carley, **Co-Training on Social Networks: A Joint Label Propagation and Node Classification Approach for Stance Learning**
2. David Beskow, **Sumeet Kumar,** Kathleen M. Carley, **The Evolution of Political Memes: Detecting and Characterizing Internet Memes with Deep Learning**

Refereed Journals and Conference Proceedings

3. **Sumeet Kumar**, Kathleen M. Carley, **What to Track on the Twitter Streaming API? A Knapsack Bandits Approach to Dynamically Update the Search Terms**, ASONAM Conference, Vancouver, Canada, 2019 - (Accepted - to appear)
4. **Sumeet Kumar**, Kathleen M. Carley**, Tree LSTMs with Convolution Units to Predict Stance and Rumor Veracity in Social Media Conversations**, ACL Conference, Florence, Italy, 2019 (Accepted - to appear)
5. Babcock, M., Cox, R.A.V. and **Kumar, Sumeet**, **Diffusion of Pro-and Anti-false Information Tweets: the Black Panther Movie Case**. *Computational and Mathematical Organization Theory*,25(1),pp.72-84.2019 DOI:10.1007/s10588-018-09286-x
6. **Sumeet Kumar,** Hakan Erdogmus, Bob Iannucci, Martin Griss, and João Diogo Falcão. 2018. **Rethinking the Future of Wireless Emergency Alerts: A Comprehensive Study of Technical and Conceptual Improvements.** (UBICOMP) Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 2, 2, Article 71 (July 2018), 33 pages. DOI:10.1145/3214274
7. **Sumeet Kumar,** Kathleen M. Carley, **People2Vec: Learning Latent Representation of Social Media Users,** SBP-BRiMS, 154-163, Washington DC, 2018 DOI:10.1007/978-3-319-93372-6_17
8. **Kumar, Sumeet** & Carley, Kathleen. **Simulating Attacks on the US Fiber-Optics Internet Infrastructure**, 50th conference on Winter simulation. Winter Simulation Conference, Las Vegas. 2017 DOI:10.1109/WSC.2017.8247869
9. **Sumeet Kumar,** Matthew Benigni, and Kathleen M. Carley, **The Impact of US Cyber Policies on Cyber-Attacks Trend**, IEEE Conference on Intelligence and Security Informatics (ISI), 181-186, Tucson, US, 2016 DOI:10.1109/ISI.2016.7745464
10. **Sumeet Kumar,** Kathleen M. Carley, **Approaches to Understanding the Motivations Behind Cyber Attacks**, IEEE Conference on Intelligence and Security Informatics (ISI), 307-309, Tucson, Arizona, US, 2016 DOI:10.1109/ISI.2016.7745496
11. **Sumeet Kumar**, Hakan Erdogmus, João Diogo Falcão, Martin Griss, Bob Iannucci, **Location-Aware Wireless Emergency Alerts,** IEEE Homeland Security Technologies Conference, Boston, USA, 2016, DOI: 10.1109/THS.2016.7568902
12. Bob Iannucci, João Diogo Falcão, **Sumeet Kumar,** Hakan Erdogmus, Martin Griss, **From Alerting to Awareness**, IEEE Homeland Security Technologies Conference, Boston, USA, 2016 DOI:10.1109/THS.2016.7801354
13. Jia Zhang, Bob Iannucci, Mark Hennessy, Kaushik Gopal, Sean Xiao, **Sumeet Kumar**,. **A Federated Platform for Mobile Data-Centric Service Development and Sharing"**, in Proceedings of 2013 IEEE 10th International Conference on Services Computing (SCC), Santa Clara, California, USA, pp. 446-453, 2013 DOI:10.1109/SCC.2013.34

Publications in Peer-Reviewed Workshop Proceedings

14. João Diogo Falcão, Joel Krebs, **Sumeet Kumar**, and Hakan Erdogmus. 2018. **OpenAlerts: A Software System to Evaluate Smart Emergency Alerts and Notifications.** In Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers (UbiComp '18). ACM, New York, NY, USA, 1250-1255. DOI:10.1145/3267305.3274115

15. **Sumeet Kumar** and Kathleen M. Carley. 2018. **Towards Group-Activities Based Community Detection.** In Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers (UbiComp '18). ACM, New York, NY, USA, 1178-1183. DOI:10.1145/3267305.3274765

16. **Sumeet Kumar,** Kathleen M. Carley, **Understanding DDoS Cyber-Attacks using Social Media Analytics**, IEEE Conference on Intelligence and Security Informatics (ISI), 231-236, Tucson, US, 2016 DOI:10.1109/ISI.2016.7745480

17. **Sumeet Kumar,** Kathleen M. Carley**, DDoS cyber-attacks network: Who's attacking whom**, IEEE Conference on Intelligence and Security Informatics (ISI), 218-218, Tucson, Arizona, US, 2016 DOI:10.1109/ISI.2016.7745476

18. **Sumeet Kumar**, Le T. Nguyen, Ming Zeng, Kate Liu, and Joy Zhang. 2015. **Sound Shredding: Privacy Preserved Audio Sensing**. In Proceedings of the 16th International Workshop on Mobile Computing Systems and Applications (HotMobile '15). ACM, New York, NY, USA, 135-140. , 2015 DOI:0.1145/2699343.2699366

Teaching and Tutorials

- At CMU, as a Teaching Assistant, I have given lectures on Software Engineering and Dynamic Network Analysis
- I taught topic modeling (`LDA & LSA') and `Geo-temporal Networks' in CASOS Summer Institute 2017,18,19
- I along with Kenneth Joseph and Fred Morstatter gave a tutorial titled 'Challenges in Detecting Events with Social Media Data: Collecting, Modeling, and Exploring' at the SBP-BRiMS 2016 conference.
- I have conducted teaching sessions on software design patterns and architectures at Intergraph and Talentica.

Awards and Recognitions

- SBP-BRiMS Conference, Challenge problem winner, 2018
- CMU Carnegie Institute of Technology Dean's Fellowship 2014-15
- Three 'Applause Level 3' awards in a year time frame (2013-2014) at Symantec, Mountain View.
- Star Team Award 2009 and Three "Pat on the Back" awards at Intergraph, India in three years

Professional Experience: Over 5 years of experience in software development & research

2013 to 2014

Symantec Corporation, Mountain View, USA (Sep 2013- Aug 2014) Role: Software Engineer
- Created an architecture to collect and store backup appliance sensors data
- Applied machine learning to predict possible hardware failures

2010 to 2011

Talentica Software, Pune, India (July 2010 - Nov 2011) Role: Development Engineer
- Designed and Implemented a data access layer for applications using **WCF data service**
- Added campaign management for an e-commerce application using **NxBre Rules Engine** in **C#**
- Improved performance of an application by 70% by memoizing function calls using **Memcached**
- Created a load-balanced reporting server to generate reports using **WCF and MS SQL Service**
- Added PDF reports for a banking client using **SSRS**

2007 to 2010

Intergraph, Hyderabad, India (August 2007 - July 2010) Role: Software Analyst
- Smart Marine (SM3D) Copy of Ship Structural Entities (Technologies: **C#, VB.Net, SQL**)
  - Designed and implemented initial architecture to copy entities with rules
  - Improved performance by profiling the code and caching SM3D objects
- SM3D Molded Forms & Structural Detailing Modules (Technologies: **VC++, VB6, Oracle**)
  - Added support for Oracle database
  - Added Automated tests for SM3D

Programming Languages Python, Java C#, Ruby, JavaScript, VB.Net, SQL
Other Skills: Software Design & Architecture, Android Development, Windows Desktop Applications Development