Prashant Chandrasekar

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ACADEMIC EXPERIENCE

University of Mary Washington, Fredericksburg, VA August 2021-Present
Department of Computer Science
Assistant Professor

EDUCATION

Virginia Tech – Blacksburg, VA May 2021
Ph.D. Computer Science (GPA: 3.86/4.0)

Virginia Tech – Blacksburg, VA May 2019
M.S. Computer Science

University of Michigan - Ann Arbor, MI December 2009
B.S.E Computer Science & Engineering

RESEARCH EXPERIENCE

Research Interests: Design of information systems; Digital libraries; Applied Natural Language Processing; Knowledge representation; Knowledge graphs

Study behavior during disruptions caused by hurricanes March 2018 – May 2020
Digital Libraries Research Laboratory – Blacksburg, VA
Grant: CRISP Type 2/Collaborative Research: Coordinated, Behaviorally-Aware Recovery for Transportation and Power Disruptions (CBAR-tpd), NSF CMMI-1638207, PI Dr. Murray-Tuite
Project Goal: Identify infrastructure and human impact during hurricane and to propose best practices for Emergency Management System and other infrastructures to improve recovery time
Method:

1. Request information that researchers in policy planning, transportation and power want to retrieve from Twitter.
2. Execute a set of processes to crawl tweets using queries that match their information need.
3. Design and develop analytical workflows to a) predict geo-location of collection of tweets, b) identify tweets that talk specifically about power outage, infrastructure damage and transport disruptions, c) identify user preparation and response as represented in social media, among others.

Impact/Outcome: We were able to:

1. Collect over 100 million tweets that relate to human preparedness and response, school closures, power outages, infrastructure damage, etc.
2. Extract features such as tweet geo-location, tweet relevance, and categories (such as tweet about utility damage, emotional support, among others), that can be applied to future hurricanes.
3. Extract text-based features such as sentiment, tweet topic, etc.
4. Test theories by comparing information collected from Twitter against data collected from official sources such as survey responses and outage maps.

Social network-based clinical trial for addiction recovery January 2015 – May 2018
Digital Libraries Research Laboratory **–** Blacksburg, VA
Grant: The Social Interactome of Recovery: Social Media as Therapy Development, NIH 1R01DA039456-01, PI Dr. Warren Bickel
Project Goal: Build a social-network-centric framework and represent computer science-related efforts in the study that aims to understand how participants, who are in recovery from substance addiction, behave with one another.

Method:

1. Prepare design of social network, with key features such as testimonials, AA-type virtual meetings, and integration of surveys, that bring a more "recovery-centric" feel to the participants.
2. Develop and instrument all the data collection methods that help capture the very minute feedback that we can receive from the participants, regarding their peer-to-peer engagement and website engagement.
3. Aid statisticians in their research efforts, by designing and developing data collection and analysis pipelines to bring the data from all the heterogeneous sources, under one umbrella.
4. Conduct exploratory analysis of behavior of participants in the network and build models to predict/infer behavioral outcomes such as information propagation, engagement and social influence and psychological outcomes such as addiction relapse.

Impact/Outcome: We were able to:

1. Successfully conduct 5 clinical trials that involved a total of 1280 participants.
2. Integrate and process approximately 13,000 survey responses and social network-based engagement data.
3. Lessons learnt from execution and analysis: a) how monetary incentives play a role on user engagement, b) that it was important to group people with similar backgrounds and addiction history, for longer interactions and c) that it is best to have shorter term trials over long-term so that we could have multiple iterations and test out many more theories.

Study behavior of individuals and communities in Twitter August 2019 – December 2019

Digital Libraries Research Laboratory **–** Blacksburg, VA

Grant: Global Event and Trend Archive Research, NSF (IIS-1619028 and 1619371), PI Dr. Edward Fox

Project Goal: Support sociologists and other subject-matter-experts in the data collection and analysis needs

Method:

1. Interview subject-matter-experts to get a list of events, keywords and queries for use to collect Twitter data.

2. Define Twitter search term queries and bounding-boxes of locations to search within and initiate crawling

3. Pre-process data and extract measures of interest

Impact/Outcome: We were able to:

1. Collect tweets for various natural disasters events, and events like school shootings.
2. Extract measures of interest.

RESEARCH EXPERIENCE - Internships

Topic: Studying depression in veterans May 2017- August 2017

Oak Ridge National Lab – Oak Ridge, TN

Role: Research Intern

Goal: Propose methodology for longitudinal study of veterans' psychological progress

Method: Literature review and proof-of-concept design

Impact/Outcome: Describe a state-of-the-art framework with a list of novel features for model building, using psychological notes, authored by medical professionals, about their interactions with veterans.

TEACHING EXPERIENCE

University of Mary Washington August 2021-Present

- CPSC 110: Introduction to Python (Fall 2021)
- CPSC 340: Data Structures and Algorithms (Fall 2021, Spring 2022)
- CPSC 370/DATA 370: Information Retrieval (Spring 2022)

MENTORSHIP EXPERIENCE

1. Classifying addiction recovery-related testimonials

- I guided two undergraduate students who were tasked to classify sentences in testimonials as either a) discussing a successful event or b) not discussing a successful event.

- I helped them manually label the dataset and provided them with documentation and resources that would help them build a sophisticated machine learning model.
- Their model was deployed during the clinical trial of the Social Interactome project to identify when participants were discussing a success story.

2. Friendship recommendation

Report: http://hdl.handle.net/10919/70956

- I advised an undergraduate student group in their capstone class project: To assign homophily (or friendship strength) scores for every pair of participants in the Social Interactome clinical trial. The top 'k' friendships were to be recommended to the participants during the trial.
- I provided the student group with datasets such as the participant website and peer-to-peer engagement information and their survey responses.
- Their algorithm was used by statisticians to compare average homophily between pairs in the test network against the control network.

3. Querying and Analysis Portal

Report: http://hdl.handle.net/10919/83202

- I mentored an undergraduate student group in their capstone class project: To design a data store that fused all the data we had collected from the clinical trial participants in the Social Interactome project. This included background information, trial engagement data and survey responses, each of which was stored separately.
- I helped them define a new schema and construct a graph-based representation so that researchers could run advanced queries.
- Their solution served as a proof-of-concept for my research.

4. **Twitter-Based Knowledge Graph for Researchers**

Report: http://hdl.handle.net/10919/98239

- I mentored an undergraduate student group in their capstone class project: An effort to construct a knowledge graph of computation-based tasks and corresponding outputs to be used by subject-matter-experts (SME) studying tweets.
- They employed a methodology, that is part of my doctoral research, to capture all the information goals of the SME and sequence of tasks/analyses to derive the information.
- The goal to "workflow" associations as well as associations between information goals were stored in a knowledge graph.
- They were able to deploy a proof-of-concept graph using GRAKN.AI

PUBLICATIONS

Edward A. Fox, **Prashant Chandrasekar**, How Should One Explore The Digital Library Of The Future, Data and Information Management, 2021

Prashant Chandrasekar, Digital Library Framework For Behavioral Science. Bulletin of IEEE Technical Committee on Digital Libraries, Volume 13 Issue 2, September 2017

Prashant Chandrasekar, Islam Harb, Monika Akbar, Ann Gates, Chris Frank, Warren Bickel, Edward Fox and Elsa Tai. A DL framework and case studies with linked open data. Paper accepted for RUMOUR 2017, a workshop held in conjunction with ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2017, http://2017.jcdl.org/), Toronto, Canada, June 19-23, 2017

Prashant Chandrasekar, Xuan Zhang, Saurabh Chakravarty, Arijit Ray, John Krulick, and Alla Rozovskaya, The Virginia Tech System at CoNLL-2016 Shared Task on Shallow Discourse Parsing. In CoNLL Shared Task (2016).

Warren K. Bickel, Amanda J. Quisenberry, **Prashant Chandrasekar**, Edward A. Fox, Christopher T. Franck. The Social Interactome of Recovery: Network Topology Influences Social Media Engagement. Proc. 2016 CPDD (College on Problems of Drug Dependence) Annual Meeting, selected based on abstract for oral presentation June 15, 2016

Tarek Kanan, Souleiman Ayoub, Eyad Saif, Ghassan Kanaan, **Prashant Chandrasekar**, Edward Fox. Extracting Named Entities Using Named Entity Recognizer and Generating Topics Using Latent Dirichlet Allocation Algorithm for Arabic News Articles. Proceedings

International Computer Sciences and Informatics Conference (ICSIC 2016), Amman-Jordan.

Tarek Kanan, Sagnik Ray Choudhury, C. Lee Giles, **Prashant Chandresekar**, Edward A. Fox. Digital Library and Archiving for Qatar. Bulletin of IEEE Technical Committee on Digital Libraries, 11(2), October 2015, 1 page

Zhiwu Xie, **Prashant Chandresekar**, Edward A. Fox. A UWS Case for 200-Style Memento Negotiations. Bulletin of IEEE Technical Committee on Digital Libraries, 11(2), October 2015, 1 page

POSTER

Prashant Chandrasekar, Kris Wernstedt, Edward A. Fox, Pamela Murray-Tuite (2020). Hurricane Irma: Multiple Avenues of Study. Poster, with abstract in Proceedings International Conference on Information Systems for Crisis Response and Management (ISCRAM 2020), May 2020, page 1166, to be presented in May 2021 at ISCRAM 2021. Blacksburg, VA.

Prashant Chandrasekar, Edward A. Fox. Interactive Digital Library Support for Workflows: Applying Machine Learning in Network Science. Algorithms That Make You Think, Fourth Annual Virginia Tech Workshop on the Future of Human-Computer Interaction, April 11-12 2019

Zhiwu Xie, **Prashant Chandrasekar**, and Edward A. Fox. Using Transactional Web Archives to Handle Server Errors. Poster in Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2015). June 21-25, 2015

Tarek Kanan, Sagnik Ray Choudhury, C. Lee Giles, **Prashant Chandrasekar** and Edward Fox. Digital Library and Archiving for Qatar. 5 minute lightning talk, with poster in Proc. Web Archiving and Digital Libraries Workshop (WADL 2015) - Joint Conference on Digital Libraries (JCDL). Knoxville, TN. 24 June 2015

TECHNICAL SKILLS

Languages/Frameworks	Python, PL/SQL, Java, JMP, Minitab
Frequently Used Libraries	Transformers, Sci-py, Numpy, Tidy data, Scikit-learn, Gensim, etc.

INDUSTRY EXPERIENCE

Intuit Inc. – Bangalore, India — April 2011 – November 2013
Role: Software Developer and Data Engineer

Intuit Inc. - Mountain View, California — June 2010 – March 2011
Role: Web Analytics Engineer

Lehman Brothers Inc. - New York, New York — May-August 2007
Role: Technology Analyst Intern

Emirates Airlines – Dubai, U.A.E — May 2005 - August 2005
Role: IT Intern