

SRIRAM SOMANCHI

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RESEARCH INTERESTS

My interest is in developing computationally efficient statistical machine learning algorithms for pattern detection in large scale data with applications to healthcare, public health, and other real-world problems in business, management, and policy.

Academic Positions

University of Notre Dame

Assistant Professor

2016 - Present

Department of IT, Analytics, and Operations
Mendoza College of Business

University of Notre Dame

Instructor

2015 - 2016

Department of Management
Mendoza College of Business

EDUCATION

Carnegie Mellon University

PhD in Information Systems and Management

Dec 2015

Title: Detecting Anomalous Patterns in Health Care Data

Advisor: Prof. Daniel B. Neill

Carnegie Mellon University

Masters in Machine Learning

May 2015

Carnegie Mellon University

M. Phil in Public Policy Management

May 2013

Indian Institute of Science

Masters in Computer Science

May 2008

Advisor: Prof. Y. Narahari

Jawaharlal Nehru Technological University

Bachelors in Computer Science and Engineering

May 2006

SELECTED HONORS & AWARDS

- Association for Information Systems (SIG Health) Best Paper Award - Junior Researcher, 2016
- Heinz College's George Duncan Award for Excellence in Doctoral Studies
- Heinz College's Outstanding Teaching Assistant Award
- Eric & Wendy Schmidt 'Data Science for Social Good' Summer Fellowship 2013
- All India 30th in Graduate Aptitude Test in Engineering (GATE) 2005 with 99.89 percentile

INDUSTRY EXPERIENCE

Data Science for Social Good Fellowship , Chicago	Summer 2013
Microsoft India Development Center , Hyderabad, India Software Development Engineer	2008-2010

RESEARCH EXPERIENCE

Publications

- S. Somanchi, A. V. Parwani and D. B. Neill. Detecting Anomalous Patterns in Digital Pathology Whole Slide Images. *Statistics in Medicine*, forthcoming.
- S. Somanchi and D. B. Neill. Graph Structure Learning from Unlabeled Data for Early Outbreak Detection. *IEEE Intelligent Systems*, vol. 32, no. 2, pp. 80-84, 2017.
- S. Somanchi and R. Telang. Security, Fraudulent transactions and Customer Loyalty: A Field Study. *Thirty Seventh International Conference on Information Systems (ICIS)*, 2016.
- S. Somanchi, S. Adhikari, A. Lin, E. Eneva, R. Ghani. Early Prediction of Cardiac Arrest (Code Blue) using Electronic Medical Records. *21st ACM SIGKDD Conferences on Knowledge Discovery and Data Mining*, 2015.
- S. Speakman, S. Somanchi, E. McFowland III, D. B. Neill. Penalized fast subset scanning. *Journal of Computational and Graphical Statistics*, 2015, in press. **Selected for "Best of JCGS" invited conference session by the journal's editor in chief.**
- S. Speakman, S. Somanchi, E. McFowland III, and D. B. Neill. Disease surveillance, case study. In R. Alhajj and J. Rokne, eds., *Encyclopedia of Social Network Analysis and Mining*, pp. 380-385. Springer, 2014.
- S. Somanchi, S. Adhikari, A. Lin, E. Eneva, R. Ghani. Early Code Blue Prediction Using Patient Medical Records. *Workshop in Neural Information Processing Systems (NIPS)*, 2013.
- S. Somanchi and D. B. Neill. Discovering anomalous patterns in large digital pathology images. *Proc. 8th INFORMS Workshop on Data Mining and Health Informatics*, 2013.
- S. Somanchi and D. B. Neill. Fast graph structure learning from unlabeled data for outbreak detection. *Emerging Health Threats Journal* 4:11,017, 2011.
- S. Speakman, E. McFowland III, S. Somanchi, and D. B. Neill. Scalable detection of irregular disease clusters using soft compactness constraints. *Emerging Health Threats Journal* 4:11, 121, 2011.

- S. Somanchi, N. Chaitanya and Y. Narahari. A Novel Bid Optimizer for Sponsored Search Auctions Using Cooperative Game Theory. *In Proceedings of IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology*, 2009.

Invited talks and Presentations

- S. Somanchi and R. Telang. Impact of Security Events and Fraudulent Transactions on Customer Loyalty: A Field Study, Workshop on Economics of Information Security (WEIS), 2017.
- L. Brandimarte, E. McFowland III, S. Somanchi, U. Ananthakrishnan. Does Government Surveillance Give Twitter the Chills?, Workshop on Information Security and Privacy (SIGSEC), 2016.
- S. Somanchi, E. McFowland III, and D. B. Neill. Detecting Anomalous Patterns of Care using Health Insurance Claims, INFORMS, 2016.
- L. Brandimarte, E. McFowland III, S. Somanchi, U. Ananthakrishnan. Does Government Surveillance Give Twitter the Chills?, INFORMS, 2016.
- S. Somanchi, E. McFowland III, and D. B. Neill. Detecting Anomalous Patterns of Care using Health Insurance Claims, Conference on Digital Experimentation (CODE), MIT, 2016.
- E. McFowland III, S. Somanchi, and D. B. Neill. Efficient Discovery of Heterogeneous Treatment Effects in Randomized Experiments via Anomalous Pattern Detection, Conference on Digital Experimentation (CODE), MIT, 2016.
- I. Adjerid, S. Somanchi, and R. Gross. Why Healthcare Should Stop Worrying and Learn to Love the Machine: Predicting Inpatient Admissions from Emergency Department Data, Workshop on Health Informatics Technology and Economics (WHITE), 2016.
- S. Somanchi, E. McFowland III, and D. B. Neill. Detecting Anomalous Patterns of Care using Health Insurance Claims, Workshop on Health Informatics Technology and Economics (WHITE), 2016.
- E. McFowland III, S. Somanchi, D. B. Neill. Efficient Discovery of Heterogeneous Treatment Effects in Randomized Experiments via Anomalous Pattern Detection, International Workshop on Advanced Probability, 2016.
- S. Somanchi, E. McFowland III, and D. B. Neill. Detecting Anomalous Patterns of Care using Health Insurance Claims, International Workshop on Advanced Probability, 2016.
- S. Somanchi. Detecting Anomalous Patterns in Health Care Datasets, Stanford Center for Biomedical Informatics Research, BMIR Colloquia, Stanford University, 2015.
- S. Speakman, S. Somanchi, E. McFowland III, D. B. Neill. Penalized fast subset scanning, 45th Symposium on the Interface between Computing Science and Statistics, Morgantown, WV, 2015.
- S. Somanchi and D. B. Neill. A Star-shaped Scan Statistic for Detecting Irregularly-Shaped Spatial Clusters, International Workshop on Advanced Probability, 2014.
- S. Somanchi and D. B. Neill. Discovering Anomalous Patterns in Large Digital Pathology Images. Data Mining-Health Informatics, INFORMS Annual Conference, Minneapolis, 2013.
- S. Somanchi, D. B. Neill. Fast graph structure learning from unlabeled data for outbreak detection. INFORMS Annual Conference, Charlotte, NC, 2011.

Submitted and In-Preparation

- S. Somanchi, I. Adjerid, and R. Gross. To Predict or Not to Predict: The Case of Inpatient Admissions to the Emergency Department. *Submitted*.
- S. Somanchi, E. McFowland III, and D. B. Neill. Detecting Anomalous Patterns of Care using Health Insurance Claims. *Working paper*.
- S. Somanchi and R. Telang. Impact of Security Events and Fraudulent Transactions on Customer Loyalty: A Field Study. *Working paper*.
- E. McFowland III, S. Somanchi, and D. B. Neill. Efficient Identification of Heterogeneous Treatment Effects in Randomized Experiments, via Anomalous Pattern Detection. *Working paper*.

RESEARCH GRANTS

- PNC center small research grant for predicting customer security violations, 2013 (with Prof. Rahul Telang)
- PNC center small research grant for monitoring customer financial health, 2014 (with Edward McFowland III and Prof. Michael D. Smith)

TEACHING EXPERIENCE

University of Notre Dame

Instructor

- Data Analysis with Python, Fall 2017.
- Statistical Inference in Business, Spring 2016, Spring 2017.

Carnegie Mellon University

Teaching Assistant

- Statistics for IT Managers
- Statistics for Policy Analysis
- Large Scale Data Analysis
- Exploring and Visualizing Data
- Applied Data Science

ACADEMIC SERVICE

Adhoc Reviewer

- Management Information Systems Quarterly (MISQ)
- Information Systems Research (ISR)
- INFORMS Data Science Conference
- Conference on Information Systems and Technology
- International Conference on Information Systems
- International Society for Disease Surveillance

Program Committee

- INFORMS Data Science Conference
- Conference on Information Systems and Technology

Award committee

- INFORMS Data Mining Best Paper award
- SIGHealth Best Researcher award

SOFTWARE TECHNOLOGIES

- Programming Languages: C, C++, C#, Java, Matlab, R, Python
- Database: SQL