Sathappan Muthiah

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Work Permit: F1 until 2019
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Summary

Phd student working in spatio-temporal event forecasting using open-source indicators (OSI) with specific focus on making predictions with reasoning. Experienced with working on big data, text and time series mining. Broadly interested in maching learning, temporal mining and data science.

Education

- **PhD** in Computer Science — June 2014 — present
  Virginia Tech — Arlington, VA
  GPA: 3.80
  Advisor: Dr. Naren Ramakrishnan
- **MS.** in Computer Science — Jan 2012 — June 2014
  Virginia Tech — Arlington, VA
  GPA: 3.82
  Advisor: Dr. Naren Ramakrishnan
- **B.Tech. in Information Tech.** — 2007 — 2011
  National Institute of Tech. — Bhopal, India
  GPA: 8.65

Professional Experience

- **Virginia Tech** — Spring 2012 — Present
  GRA, Discovery Analytics Center — *Arlington, VA*
  - IARPA FUNGCAT: Design and Development of deep Learning models capable of predicting the protein function of a given gene sequence.
  - IARPA MERCURY: Establishing techniques for fusing alerts from multiple streams (or models).
  - IARPA OSI: Worked on real-time forecasting of spatio-temporal events like Civil Unrest
  - Handled streaming, ingestion (Web Scraping or via API) and enrichment of several publicly available data sources like News, Blogs, Facebook events, Twitter
  - Implemented big data unrest forecasting pipeline in python over AWS cluster framework
  - Collaborated with several institutes such as NDSSL (at VT), University of Maryland, CACI, Basis Tech., University of California-San Diego and San Diego State University, USC Information Sciences Institute
  - Press coverage: `http://www.cccblog.org/2012/09/22/building-a-data-eye-in-the-sky/`

- **Indian Institute of Scientific Education and Research** — Nov 2008 — Jan 2009
  Intern, advised by Dr. Prashanta Panigrahi — *Kolkata, India*
  - Studied the feasibility of a quantum computing system using common and attainable finite dimensional multipartite quantum states.

- **National Institute of Oceanography** — May-June 2010
  Intern, mentored by Dr. Biswajit Chakraborty — *Goa, India*
  - Estimated geophysical parameters using SONAR Backscatter data obtained off an experiment on the Western Continental shelf of India. Developed processing and cleansing techniques to process backscatter data and used simplex method for estimation.

Publications

D. K. Gupta, S. Muthiah, D. Mares, and N. Ramakrishnan. Forecasting Civil Strife: An Emerging Methodology. In *HUSO The Third International Conference on Human and Social Analytics*, 2017

P. Chakraborty, S. Muthiah, R. Tandon, and N. Ramakrishnan. Hierarchical Quickest Change Detection via Surrogates. *arXiv preprint arXiv:1603.09739*, 2016

S. Muthiah, B. Huang, J. Arredondo, D. Mares, L. Getoor, G. Katz, and N. Ramakrishnan. Capturing planned protests from open source indicators. *AI Magazine*, 37(2), 2016

S. Muthiah, P. Butler, R. P. Khandpur, P. Saraf, N. Self, A. Rozovskaya, L. Zhao, J. Cadena, C.-T. Lu, A. Vullikanti, A. Marathe, K. Summers, G. Katz, A. Doyle, J. Arredondo, D. K. Gupta, D. Mares, and N. Ramakrishnan. Embers at 4 years: Experiences operating an open source indicators forecasting system. In *Proceedings of the 22Nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, KDD '16, pages 205–214, New York, NY, USA, 2016. ACM

Y. Ning, S. Muthiah, H. Rangwala, and N. Ramakrishnan. Modeling precursors for event forecasting via nested multi-instance learning. In *Proceedings of the 22Nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, KDD '16, pages 1095–1104, New York, NY, USA, 2016. ACM

S. Muthiah, B. Huang, J. Arredondo, et al. Planned Protest Modeling in News and Social Media. In *AAAI Conference on Artificial Intelligence, January 25-30, 2015*, pages 3920–3927, 2015

J. Schlachter, A. Ruvinsky, L. A. Reynoso, S. Muthiah, and N. Ramakrishnan. Leveraging topic models to develop metrics for evaluating the quality of narrative threads extracted from news stories. *Procedia Manufacturing*, 3:4028–4035, 2015

Y. Ning, S. Muthiah, R. Tandon, and N. Ramakrishnan. Uncovering news-twitter reciprocity via interaction patterns. In *Advances in Social Networks Analysis and Mining (ASONAM), 2015 IEEE/ACM International Conference on*, pages 1–8. IEEE, 2015

N. Ramakrishnan, P. Butler, S. Muthiah, N. Self, et al. 'Beating the news' with EMBERS: Forecasting Civil Unrest using Open Source Indicators. In *International Conference on Knowledge Discovery and Data Mining, KDD, August 24 - 27, 2014*, pages 1799–1808, 2014

A. Doyle, G. Katz, K. Summers, C. Ackermann, I. Zavorin, Z. Lim, S. Muthiah, P. Butler, N. Self, L. Zhao, et al. Forecasting significant societal events using the embers streaming predictive analytics system. *Big Data*, 2(4):185–195, 2014

Activities

- **Intellectual Property:** P. Butler, S. Muthiah, and N. Ramakrishnan. Alert Generation from Multiple Streams, 2016. VTIP 17-047
- **Program Committee:** ACM SIGKDD 2018, ASONAM 2018

Awards and Honors

- **Student Travel Award** 2016
  KDD
- **Pratt Fellowship** 2015
  Virginia Tech
- **Deployed Application Paper Award** 2014
  IAAI

Technical Skills

- **Programming:** Python, C/C++, R, Java, Matlab, HTML, PHP
- **Frameworks:** NOSQL: MongoDB, ElasticSearch, Tensorflow, MapReduce

Participation in Conferences

- **KDD 2016**, 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, San Francisco, USA, August 2016.
- **KDD 2015**, 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Sydney, Australia, August 2015.
- **IAAI 2014**, 27th Conference on Innovative Applications of Artificial Intelligence, Austin, USA, Jan 2014.