

PRITHWISH CHAKRABORTY

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Education

Fall 2010 - **Current** **PhD Student** in Computer Science, Virginia Tech, USA.
 Advisor Dr. Naren Ramakrishnan
 GPA: 3.97/4.00
2006 - 2010 **B.E.** in Electronics and Telecomm. Engg., Jadavpur University, India.
 GPA: 9.27/10

Research Statement

Research Interests

Primary Focus : *Multi-variate spatio-temporal modeling* using Bayesian Nonparametric methods.

Application area: infectious disease spread and event modeling.

Broad Focus : Data Science, Machine Learning and Pattern Recognition.

Other areas of interests include *Functional Analysis*, *Statistical Image Processing* and *Control Theory*.

Research Problems

Multivariate Temporal Modeling with Surrogates. Temporal Models of multivariate data using noisy signals from causal and weakly correlated surrogate signals.

- *Influenza-like Illness* Seasonal and short-term (ILI) spread modeling and real-time forecasts. **Projects:** (1) Latin America, EMBERS for IARPA OSI Program (winning team), (2) US, DTRA, (3) US, CDC Forecast Challenge and, (4) US, Scicast Flu Forecast Challenge.
- *Chikungunya* Spread Modeling and real-time forecasts. **Projects:** EMBERS for IARPA OSI Program.
- *Dengue* Spread Modeling and forecasts. **Projects:** EMBERS for IARPA OSI Program.

Event Detection in Non-stationary Multi-variate Data Identifying Significant Pattern changes from correlated and possible hierarchal data under spatio-temporal constraints. **Projects:** EMBERS for IARPA OSI Program.

Spatio-Temporal Modeling under network constraints Spatio-temporal models over dynamic networks for event detection and case-count prediction. **Projects:** (1) EMBERS for IARPA OSI Program and (2) D4D Data Challenge.

Professional Experience

Fall 2011 - **Current:** **Graduate Research Assistant**, Discovery Analytics Center.

Advised by: Prof. Naren Ramakrishnan

June 2012: **Visiting Researcher**, Microsoft Research India.

Invited by: Dr. Srivatsan Laxman

Summer 2011: **SDE Intern**, Amazon Web Services, Platform Technologies.

Mentored by: Paul Sharpe

Fall 2010 - Spring 2011: **Graduate Teaching Assistant**, Course: Introduction to C++.

Instructor: Mr. N.D. Barnette

Summer 2009: **Research Internship**, Indian Institute of Technology, Delhi.

Supervisor: Prof. B.K. Panigrahi

Publications

Miscellaneous

Patent	M. Marwah, M. Arlitt, P. Chakraborty, and N. Ramakrishnan. Predicting near-future photovoltaic generation, Sept. 28 2012. US Patent App. 13/631,480
Invited Talks	P. Chakraborty. Data Driven Model for Disease Forecasting, 10 2014. Invited Talk, First IEEE international Workshop on Big Data in Computational Biology (BCDE 2014)
Opinion Piece	P. Chakraborty. US Flu Forecast: Exploring links between national and regional level seasonal characteristics. http://bit.ly/1CSHTk7 , 2014. Accessed: 2015-03-21

Current Publications

2015	<p>P. Khadivi, P. Chakraborty, R. Tandon, and N. Ramakrishnan. Time series forecasting via noisy channel reversal. In <i>IEEE International Workshop on Machine Learning for Signal Processing</i>. IEEE, 09 2015. to appear</p> <p>Z. Wang, P. Chakraborty, S. R. Mekaru, J. S. Brownstein, J. Ye, and N. Ramakrishnan. Dynamic Poisson Autoregression for Influenza-Like-Illness Case Count Prediction. In <i>Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining</i>, pages 1285–1294. ACM, 08 2015</p> <p>H. Wu, P. Chakraborty, S. Ghosh, and N. Ramakrishnan. Forecasting Influenza in Senegal with Call Detail Records. NETMOB 2015, 04 2015</p>
2014	P. Chakraborty, P. Khadivi, B. Lewis, A. Mahendiran, J. Chen, P. Butler, E. O. Nsoesie, S. R. Mekaru, J. S. Brownstein, M. V. Marathe, and N. Ramakrishnan. Forecasting a Moving Target: Ensemble Models for ILI Case Count Predictions. In <i>Proceedings of the 2014 SIAM International Conference on Data Mining, Philadelphia, Pennsylvania, USA, April 24-26, 2014</i> , pages 262–270, 2014
2012	<p>P. Butler, P. Chakraborty, and N. Ramakrishnan. The Deshredder: A visual analytic approach to reconstructing shredded documents. In <i>Visual Analytics Science and Technology (VAST), 2012 IEEE Conference on</i>, pages 113–122. IEEE, 2012</p> <p>P. Chakraborty, M. Marwah, M. Arlitt, and N. Ramakrishnan. Fine-Grained Photovoltaic Output Prediction Using a Bayesian Ensemble. In <i>Twenty-Sixth AAAI Conference on Artificial Intelligence</i>, 2012</p>

Other Publications

2015	<p>S. Ghosh, P. Chakraborty, E. O. Nsoesie, S. R. Mekaru, J. S. Brownstein, and N. Ramakrishnan. Are News Reports Predictive of trends in Infectious Disease Outbreaks? A Spatio-temporal Topic Modeling Analysis. submitted to PLOS CURRENTS OUTBREAKS, 08 2015</p> <p>F. S. Tabataba, P. Chakraborty, N. Ramakrishnan, M. Marathe, J. Chen, and B. Lewis. Standard Measures and Quality Metrics for Evaluating the Performance of Forecasting Methods: Special Study on Influenza in US. submitted to PLOS ONE, 04 2015</p> <p>P. Chakraborty, B. Lewis, S. Eubank, M. Marathe, J. Brownstein, and N. Ramakrishnan. How not to forecast the flu. to be submitted, 2015</p> <p>P. Chakraborty, S. Muthiah, R. Tandon, and N. Ramakrishnan. Hierarchical Quickest Event Detection via Surrogates. to be submitted, 2015</p>
2012	<p>P. Chakraborty, G. G. Roy, B. Panigrahi, R. Bansal, and A. Mohapatra. Dynamic economic dispatch using harmony search algorithm with modified differential mutation operator. <i>Electrical Engineering</i>, 94(4):197–205, 2012</p> <p>T. K. Gandhi, P. Chakraborty, G. G. Roy, and B. K. Panigrahi. Discrete harmony search based expert model for epileptic seizure detection in electroencephalography. <i>Expert Systems with Applications</i>, 39(4):4055–4062, 2012</p>
2011	G. G. Roy, S. Das, P. Chakraborty, and P. N. Suganthan. Design of non-uniform circular antenna arrays using a modified invasive weed optimization algorithm. <i>Antennas and Propagation, IEEE Transactions on</i> , 59(1):110–118, 2011

	P. Chakraborty, S. Das, G. G. Roy, and A. Abraham. On convergence of the multi-objective particle swarm optimizers. <i>Information Sciences</i> , 181(8):1411–1425, 2011
2010	G. G. Roy, P. Chakraborty, and S. Das. Designing fractional-order $PI^\lambda D^\mu$ controller using differential harmony search algorithm. <i>International Journal of Bio-Inspired Computation</i> , 2(5):303–309, 2010
	G. G. Roy, P. Chakraborty, S.-Z. Zhao, S. Das, and P. N. Suganthan. Artificial foraging weeds for global numerical optimization over continuous spaces. In <i>IEEE Congress on Evolutionary Computation</i> , pages 1–8, 2010
2009	P. Chakraborty, G. G. Roy, S. Das, and B. Panigrahi. On population variance and explorative power of invasive weed optimization algorithm. In <i>Nature & Biologically Inspired Computing, 2009. NaBIC 2009. World Congress on</i> , pages 227–232. IEEE, 2009
	G. G. Roy, B. Panigrahi, P. Chakraborty, and M. K. Mallick. On optimal feature selection using modified harmony search for power quality disturbance classification. In <i>Nature & Biologically Inspired Computing, 2009. NaBIC 2009. World Congress on</i> , pages 1355–1360. IEEE, 2009
	P. Chakraborty, G. G. Roy, S. Sinha, S. Bose, A. Mondal, and S. Das. Automatic Shape Independent Clustering Inspired By Ant Dynamics. In <i>The Proceedings of International Workshop on Machine Intelligence Research organized by Machine Intelligence Research Labs</i> , pages 64–74, 2009
	P. Chakraborty, G. G. Roy, S. Das, D. Jain, and A. Abraham. An improved harmony search algorithm with differential mutation operator. <i>Fundamenta Informaticae</i> , 95(4):401–426, 2009
	D. Jain, G. G. Roy, P. Chakraborty, and S. Das. Fuzzy Entropy-based Object Segmentation with an Inertia-Adaptive PSO. In <i>Advanced Computing and Communications, 2008. ADCOM 2008. 16th International Conference on</i> , pages 13–18. IEEE, 2008

Awards and Activities

Award	Who's Who in American College's and Universities , Virginia Tech, 2014
Honor	Alpha Epsilon Lambda . Inducted: 2013. Vice-President: 2013-2014. Upsilon Pi Epsilon . Inducted: 2013. Phi Kappa Phi . Invited: 2014 Golden Key . Invited: 2014 Tau Beta Pi . Invited: 2013
Other	Indian Student Association at Virginia Tech. Webmaster: Fall 2012 President: 2013

Technical Skills

Programming Python, C/C++, R, Java, Matlab

Javascript, Perl, HTML/CSS

Frameworks NOSQL: MongoDB, MapReduce, Django, NodeJS, Spring