Suchismit Mahapatra

Research Scientist · (Machine Learning | Deep Learning)

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About Me

I am a Research Scientist with Criteo Research, applying different Machine/Deep Learning and Optimization techniques to solve related problems. I completed my PhD with the Machine Learning and Data Science Research group at University of Buffalo. I have 7+ years of research and 5 years of developer experience during which I have been exposed and worked on a variety of problems.

Research Interests

Predominantly my area of research is in large scale machine learning and data mining. Specifically my research focuses on designing, analyzing and implementing novel machine learning algorithms that take advantage of modern hardware to enable learning and mining of massive graphs and data sets. My research interests include :

- Machine Learning
- Deep Learning
- Nonlinear/Distributed Optimization
- Parallel Computing

Academic Background

University of Buffalo, The State University of New York — *Buffalo, NY*

Ph.D. in Computer Science and Engineering — *April 2012 - June 2018*

- Topic: Scalable Nonlinear Spectral Dimensionality Reduction methods for streaming data.
- Advisors: Varun Chandola, Nils Napp & Jaroslaw Zola | GPA: 4.0 out of 4.0 (Transcript)

University of Buffalo, The State University of New York — *Buffalo, NY*

M.S. in Computer Science and Engineering — *September 2010 - June 2012*

- Topic: A Cold Start Recommendation System Using Item Correlation and User Similarity.
- Advisor: Rohini Srihari | GPA: 4.0 out of 4.0 | Department rank: 1 out of 555 (Transcript)

National Institute of Technology, Rourkela — *Rourkela, India*

B.Tech. in Computer Science and Engineering — *August 2001 - May 2005*

- Specialization: Discrete Mathematics and Algorithms
- Cumulative Score: 77% (First class with Honors)(Transcript) | Joint Entrance Exam Rank 22 out of 400,000

Honors

2019	Became a reviewer for ICML 2020.	*Palo Alto, CA*
2019	Was invited to and attended the prestigious Foundations of Deep Learning program.	*Berkeley, CA*
2017	Won a NSF Junior Researcher Award to attend CBMS Conference on Sparse Recovery.	*Las Cruces, NM*
2016	Became a NVIDIA GPU Educator.	*Santa Clara, CA*
2015	Won a NSF Student Travel Award to attend IEEE Big Data 2015.	*Santa Clara, CA*
2013	Won a rare Research Assistant-ship covering my second year as a Masters student.	*Buffalo, NY*
2008	Won the Star Performer of the Month award in Cognizant.	*Kolkata, India*
2004	Scored 99 percentile in Zonal, Discipline and National categories of National IT Aptitude Test.	*Rourkela, India*
2004	Subsequently won a Bhavishya Jyoti Scholarship for above.	*Rourkela, India*

Skills & Proficiencies

Python | C/C++ | TensorFlow | Keras | Apache MapReduce | Scala | CUDA | Hive

Research Experience

Criteo Research — *Palo Alto R&D Center, CA*

Research Scientist — *July 2018 - Present*

- Improve Click-through and Sales prediction
  - Enhanced existing production Click-through and Sales prediction pipeline using nonlinear ML techniques. Improved stability of our new models significantly from +50% to +5%. A/B test using new models resulted in +3-6% uplift in long-term RexT on all platforms.
- Theoretical aspects on Deep Learning (DL) (working with Noureddine El Karoui)
  - Working towards understanding kernel and manifold specific aspects of theoretical deep learning.

The Research Foundation for SUNY *Buffalo, NY*

Research Assistant *January 2018 - May 2018*

- Parallelized Hierarchical Clustering (worked with Haimonti Dutta)
  - Worked towards developing a novel parallel hierarchical clustering algorithm using activization strategies.
- Kernel Manifold Learning (worked with Varun Chandola)
  - Developed novel Manifold Learning techniques motivated from Gaussian Processes.

Criteo Research *Palo Alto R&D Center, CA*

Research Scientist Intern *September 2017 - December 2017*

- Efficient Domain Adaptation (worked with Suju Rajan)
  - Understanding how to efficiently deal with the Domain Adaptation problem via Optimal Transportation.

Criteo Research *Palo Alto R&D Center, CA*

Research Scientist Intern *May 2017 - August 2017*

- Cross-domain Query-Product (QP) modeling using Adversarial Transfer Learning (worked with Suju Rajan)
  - Tried to learn a robust QP model across retailer domains using Adversarial Transfer Learning.

The Research Foundation for SUNY *Buffalo, NY*

Research Assistant *January 2017 - May 2017*

- Representation learning via DL/NLSDR methods (worked with Varun Chandola / Nils Napp / Jaroslaw Zola)
  - Interpreting complex nonlinear processes using DL/NLSDR methods.
- Incorporating complex constraints for sparse Logistic Regression (worked with Varun Chandola)
  - Worked towards solving the sparse Logistic Regression problem with hierarchical tree-based constraints.

BD Biosciences *San Jose, CA*

Machine Learning Algorithm Design Intern *June 2016 - August 2016*

- Fast Clustering of Flow Cytometry (FC) data
  - Upscaled BD's clustering framework for high dimensional FC data upto ~16x.

University of Buffalo, The State University of New York *Buffalo, NY*

Research Assistant *June 2013 - December 2015*

- Nonlinear Spectral Dimensionality Reduction (worked with Varun Chandola / Jaroslaw Zola / Nils Napp)
  - Developed scalable Nonlinear Spectral Dimensionality Reduction methods in a streaming setting.
- Social Network Modeling (worked with Varun Chandola)
  - Developed the xKPGM model for social network modeling.
- Variance Reduction techniques in Distributed Optimization (worked with Haimonti Dutta / Varun Chandola)
  - Worked towards developing novel variance reduction techniques for the ERM problem.
- Understanding Rumor Propagation in Social Networks (worked with Shambhu Upadhyaya / Varun Chandola)
  - Worked towards modeling rumor propagation in social networks.
- Volcanic Flow Prediction (worked with Abani Patra / Varun Chandola / Paul Bauman)
  - Developed a novel Gaussian Process based model for prediction of flow using GPGPUs.

The Research Foundation for SUNY *Buffalo, NY*

Research Assistant *June 2011 - August 2012*

- Localization via Entropy Reduction (worked with Robert Platt)
  - Developed a novel active localization technique via sequential reduction of entropy using OpenRAVE/ROS.
- AIRS (worked with Rakesh Nagi)
  - Built sequential/parallel versions of TRUncated Search Tree algorithm.
- Name2Face (worked with Bina Ramamurthy)
  - Built Name2Face, a cloud application consuming Microsoft cloud services.

Publications

1. Modeling Graphs Using a Mixture of Kronecker Models. **Suchismit Mahapatra** and Varun Chandola. Proceedings of the 3rd IEEE International Conference on Big Data, 2015.
2. Error Metrics for Learning Reliable Manifolds from Streaming Data. **Suchismit Mahapatra**, Frank Schoeneman, Varun Chandola, Jaroslaw Zola, Nils Napp. Proceedings of SIAM Data Mining Conference, 2017
3. S-Isomap++: Multi Manifold Learning from Streaming Data. **Suchismit Mahapatra** and Varun Chandola. Proceedings of 5th IEEE International Conference on Big Data, 2017
4. Learning Manifolds from Non-stationary Streaming Data. **Suchismit Mahapatra** and Varun Chandola. (In submission)
5. A Generalized Out-of-Sample Extension Framework for Streaming NLSDR. **Suchismit Mahapatra** and Varun Chandola. (Un-

der preparation)

Seminar/Symposia

2017	S-Isomap++: Multi Manifold Learning from Streaming Data. (IEEE Big Data 2017)	*Boston, NY*
2017	Error Metrics for Learning Reliable Manifolds from Streaming Data. (SIAM SDM 2017)	*Houston, TX*
2016	Error Metrics for Learning Reliable Manifolds from Streaming Data. (UB Computer Science Mixer)	*Buffalo, NY*
2016	Fast Clustering of Flow Cytometry Data via Adaptive Mean Shift. (BD Biosciences)	*San Jose, CA*
2015	Modeling Graphs Using a Mixture of Kronecker Models. (IEEE Big Data 2015)	*Santa Clara, CA*
2012	Entropy-based localization framework for localizing known objects. (NEMS 2012)	*Bedford, MA*

Teaching

- Taught a course on Classification and Decision Trees [Q4 2018, Q2 2019, Q4 2019] while at Criteo Research.
- Taught a course on Generative Models [Q2 2019, Q4 2019] while at Criteo Research.

Activities

- Part of organizing committee for KDCloud [2014], BigSpatial [2014, 2015, 2016, 2017].
- Student Member of IEEE, SIAM and ACM.

Additional Coursework/Projects

- Implemented 3PRR Parallel Chain and PRRR Serial Chain Manipulators under Venkat Krovi
- Developed ElGooG – A search engine using ~100000 TREC documents as corpus (won the NTipS 2010 competition)
- Machine Learning course offered by Stanford under Andrew Ng
- Optimization/Mathematics/ML courses offered by Coursera