Suchismit Mahapatra

Research Scientist · (Machine Learning | Deep Learning)

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About Me

I am a Research Scientist with Amobee, applying different Machine/Deep Learning and NLP techniques to solve related problems. I completed my PhD with the Machine Learning & 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

My research focuses on designing and implementing novel algorithms which enable large-scale learning and includes :

- Machine/Deep Learning
- Natural Language Processing (NLP)
- Deep Graph/Geometric Learning
- Nonlinear/Distributed Optimization

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

2021	Became a reviewer for EMNLP 2021, ACL 2021 and NeurIPS 2021.	*Sunnyvale, CA*
2020	Became a reviewer for ICML 2021 and ICLR 2021.	*Sunnyvale, CA*
2020	Was invited to and attended the prestigious Theory of Reinforcement Learning program.	*Berkeley, CA*
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*

Skills & Proficiencies

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

Research Experience

Amobee Research — *Redwood City, CA*

Scientist I — *March 2020 - Present*

- Developed a novel bidding strategy based on Win Price (WP) estimation
  - Developed and productionized a novel bidding strategy using nonlinear ML based approaches for estimating WP.
- Built a Factorization Machine (FM/FFM) based ML pipeline for usage in production
  - Led efforts to build a FM/FFM based ML pipeline using a novel sparse matrix formulation that can handle high modality features.
- Incorporating user embeddings into existing ML/DL models to improve performance
  - Trained BERT/GAN based generative models to construct user embeddings for usage by our existing models.

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

Research Scientist — *July 2018 - December 2019*

- 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 of Deep Learning (working with Noureddine El Karoui)
  - Working towards understanding kernel and manifold specific aspects of theoretical deep learning.
- Resolving the posterior-collapse issue in Seq2Seq learning
  - Developed a quantization based approach towards resolving the posterior-collapse issue.

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)
  - Developed 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.

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.
- Volcanic Flow Prediction (worked with Abani Patra / Varun Chandola / Paul Bauman)
  - Developed a novel Gaussian Process based model for prediction of volcanic flow using GPUs.

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.

Publications

1. Interpretable Graph Similarity Computation via Differentiable Optimal Alignment of Node Embeddings. Khoa Doan, Saurav Manchanda, **Suchismit Mahapatra** and Chandan Reddy. (To appear in SIGIR 2021)
2. Discretized Bottleneck in VAE: Posterior-Collapse-Free Sequence-to-Sequence Learning. Yang Zhao, Ping Yu, **Suchismit Mahapatra**, Qinliang Su and Changyou Chen. 2020 (Under submission)
3. Learning Manifolds from Non-stationary Streaming Data. **Suchismit Mahapatra** and Varun Chandola. 2019 (Preprint available in arXiv)
4. S-Isomap++: Multi Manifold Learning from Streaming Data. **Suchismit Mahapatra** and Varun Chandola. Proceedings of 5th IEEE International Conference on Big Data, 2017
5. Error Metrics for Learning Reliable Manifolds from Streaming Data. **Suchismit Mahapatra**, Frank Schoeneman, Varun Chan-

dola, Jaroslaw Zola, Nils Napp. Proceedings of SIAM Data Mining Conference, 2017

6. Modeling Graphs Using a Mixture of Kronecker Models. **Suchismit Mahapatra** and Varun Chandola. Proceedings of the 3rd IEEE International Conference on Big Data, 2015.

Additional Certifications/Projects

- NLP certification from NVIDIA Deep Learning Institute
- Machine Learning course offered by Stanford under Andrew Ng
- Optimization/Mathematics/ML courses offered by Coursera
- Developed ElGooG – A search engine using ~100000 TREC documents as corpus (won the NTipS 2010 competition)

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.

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*