

# 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

PH.D. IN COMPUTER SCIENCE AND ENGINEERING

Buffalo, NY

April 2012 - June 2018

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

### University of Buffalo, The State University of New York

M.S. IN COMPUTER SCIENCE AND ENGINEERING

Buffalo, NY

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

B.TECH. IN COMPUTER SCIENCE AND ENGINEERING

Rourkela, India

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 <a href="#">EMNLP 2021</a> , <a href="#">ACL 2021</a> and <a href="#">NeurIPS 2021</a> .	Sunnyvale, CA
2020	Became a reviewer for <a href="#">ICML 2021</a> and <a href="#">ICLR 2021</a> .	Sunnyvale, CA
2020	Was invited to and attended the prestigious <a href="#">Theory of Reinforcement Learning</a> program.	Berkeley, CA
2019	Became a reviewer for <a href="#">ICML 2020</a> .	Palo Alto, CA
2019	Was invited to and attended the prestigious <a href="#">Foundations of Deep Learning</a> program.	Berkeley, CA
2017	Won a NSF Junior Researcher Award to attend <a href="#">CBMS Conference on Sparse Recovery</a> .	Las Cruces, NM
2016	Became a <a href="#">NVIDIA GPU Educator</a> .	Santa Clara, CA
2015	Won a NSF Student Travel Award to attend <a href="#">IEEE Big Data 2015</a> .	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

RESEARCH SCIENTIST

Palo Alto R&D Center, CA

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 REX on all platforms.
- Theoretical aspects on Deep Learning (working with [Nouredine 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

RESEARCH ASSISTANT

Buffalo, NY

January 2018 - May 2018

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

## Criteo Research

RESEARCH SCIENTIST INTERN

Palo Alto R&D Center, CA

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

RESEARCH SCIENTIST INTERN

Palo Alto R&D Center, CA

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

RESEARCH ASSISTANT

Buffalo, NY

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

MACHINE LEARNING ALGORITHM DESIGN INTERN

San Jose, CA

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

RESEARCH ASSISTANT

Buffalo, NY

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





RESEARCH ASSISTANT

Buffalo, NY


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

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- 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

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- 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

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