

Harvineet Singh

CONTACT INFORMATION	Ph.D. Student Center for Data Science New York University, NY, USA	<i>mobile:</i> +1-7028498182 <i>email:</i> hs3673@nyu.edu <i>website:</i> https://harvineet.github.io/
RESEARCH INTERESTS	Machine Learning, Statistical Modeling, Sequential Data Analysis, Interactive Learning, Network Analysis, Computational Social Science, Digital Health	
EDUCATION	Ph.D. in Data Science, <i>Center for Data Science, New York University, NY, US</i>	August 2018 - Present
	Integrated Master of Technology in Mathematics and Computing, <i>Indian Institute of Technology (IIT) Delhi, India</i>	CGPA: 8.7/10 July 2010 - July 2015
	Central Board of Secondary Education, Class XII, <i>D.A.V. Public School, Kota, Rajasthan</i>	Marks(%): 92.40 2010
	Central Board of Secondary Education, Class X, <i>B.C.M. Sr. Sec. School, Ludhiana, Punjab</i>	Marks(%): 97.40 2008
PUBLICATIONS	<ul style="list-style-type: none">• Moumita Sinha, Vishwa Vinay and Harvineet Singh. ‘Modeling Time to Open of Emails with a Latent State for User Engagement Level’. ACM International Conference on Web Search and Data Mining, WSDM 2018. [Link].• Ritwick Chaudhry*, Harvineet Singh*, Pradeep Dogga, and Shiv Saini. ‘Modeling Hint-Taking Behavior and Knowledge State of Students with Multi-Task Learning’. International Conference on Educational Data Mining, EDM 2018. [Link].• Sumit Shekhar, Dhruv Singal, Harvineet Singh, Manav Kedia and Akhil Shetty. ‘Show and Recall: Learning What Makes Videos Memorable’. IEEE International Conference on Computer Vision, ICCV Workshop on MBCC 2017. [Link].• Siddharth Bora, Harvineet Singh, Anirban Sen, Amitabha Bagchi and Parag Singla. ‘On the role of conductance, geography and topology in predicting hashtag virality’. Social Network Analysis and Mining 2015. Springer Journal. [Link].	
UNDER REVIEW	<ul style="list-style-type: none">• Prakhar Gupta*, Gaurush Hiranandani*, Harvineet Singh*, Iftikhar Ahamath Burhanuddin, Zheng Wen and Branislav Kveton. ‘Online Diverse Recommendations from Partial-Click Feedback’. Submitted August 2018. [Link].• Harvineet Singh, Moumita Sinha, Sahil Garg, Neha Banerjee, Atanu R. Sinha. ‘Survival Models for Deciding Email Send Time’. Submitted August 2018. [Link].	
MASTER’S THESIS	Predicting Virality and Adoption of Topics in Online Social Networks [Link to Presentation] [Link to Report] Worked with Prof. Amitabha Bagchi and Prof. Parag Singla to develop a machine learning algorithm for predicting virality of topics in Twitter. Investigated role of network structure and different derived features for the prediction task, achieving state-of-the-art accuracy. For the problem of	January 2014 - July 2015

*Equal Contribution

predicting future adopters of a topic, devised a graph-based approach to find embeddings of users based on their topic activity. Experiments performed on a dataset of 7.7 million Twitter users.

RESEARCH EXPERIENCE

Adobe Research, India : Research Engineer

Member of Big Data Experience Lab

July 2015 - August 2018

Devised and prototyped machine learning algorithms for problems in customer behavior analytics.

Worked on transferring technologies to Adobe's digital marketing solutions.

Adobe Research, India : Research Internship

Predicting abandonment of online shopping carts

PI: Dr. Moumita Sinha

May 2014 - July 2014

Devised an algorithm to predict return of customers after an online shopping session and tested it on large-scale web clickstream datasets. Work productized as a feature in Adobe Experience Cloud.

Adobe Research, India : Research Internship

Assisting social content creators by suggesting what, when and how to post

PI: Mr. Mohit Garg

May 2013 - July 2013

Worked on a system to infer user interests and demographic attributes from online social feed. Developed an approach based on text mining and graph analysis to find most receptive user segments. Implemented a web-based tool, as a proof-of-concept prototype, built using HTML, PHP and Python to fetch Twitter feeds and display results of data analysis.

Budapest University of Technology and Economics, Hungary

Missing value imputation for classification problems

PI: Dr. Krisztian Buza

May 2012 - July 2012

Analysed effect of imputation techniques in *missing completely at random* case. Experimented with decision tree and neural network based classifiers on both real-world and synthetic datasets.

AWARDS AND ACHIEVEMENTS

- **IITD Semester Merit Award** for meritorious academic performance (top 7% of batch).
- Awarded **HRD Scholarship** by Ministry of Human Resource Development for academic excellence at IIT, 2014.
- **All India Rank 813** in IIT-JEE (entrance examination) 2010 among 0.46 million students.
- Awarded CBSE Merit Certificates for being in **top 0.1%** nationwide in Mathematics & English secondary school examinations, 2008.
- Achieved **All India Rank 76** in National Level Science Talent Search Examination, 2008.
- 3rd in Campus Centurion, a Pan-IIT Data Analytics Competition by American Express, 2014.

PROFESSIONAL SERVICE

Teaching Assistant: Took tutorial classes and guided students for 2 courses at IIT Delhi.

- MAL 180: Discrete Mathematical Structures July 2014 - November 2014
- MAL 111: Intro to Analysis and Differential Eqns. July 2013 - November 2013

Paper Sub-reviewer: RecSys 2017, UAI 2017.

PATENT APPLICATIONS

- Moumita Sinha, Kandarp S. Khandwala, **Harvineet Singh** and D. P. Tejas. 'Online Shopping Cart Analysis'. U.S. Patent Application 14/623,248. Filed February 2015.
- Moumita Sinha, Kandarp S. Khandwala, **Harvineet Singh** and D. P. Tejas. 'Predicting Unsubscription of Potential Customers'. U.S. Patent Application 14/614,252. Filed February 2015.
- Kokil Jaidka, Prakhar Gupta, Iftikhar Ahamath Burhanuddin and **Harvineet Singh**. 'Generation of Natural Language Notifications'. U.S. Patent Application 15/163,531. Filed May 2016.
- Moumita Sinha, **Harvineet Singh**, Philippe Ferdinand and Veronique Gaudrat. 'Fatigue Control in Dissemination of Digital Marketing Content'. U.S. Patent Application 15/216,360. Filed July 2016.
- Prakhar Gupta, Shiv Kumar Saini, Gaurush Hiranandani and **Harvineet Singh**. 'End of Period Metric Projection with Intra Period Alerts'. U.S. Patent Application 15/609,254. Filed May 2017.

- Moumita Sinha, Vishwa Vinay, **Harvineet Singh** and Frederic Mary. ‘Modeling Time to Open of Electronic Communications’. U.S. Patent Application 15/808,171. Filed November 2017.
- Prakhar Gupta, Iftikhar Ahamath Burhanuddin, **Harvineet Singh** and Atanu Sinha. ‘Intelligent Analytics Interface’. U.S. Patent Application 15/808,498. Filed November 2017.

SELECTED
RESEARCH
PROJECTS

Representation Learning on Graphs

Prof. Amitabha Bagchi and Prof. Parag Singla, IIT Delhi January 2015 - July 2015

- Developed a method to learn representations of users in social networks from their activity traces.
- Demonstrated utility of extracted representations for predicting demography and future adopters.

Mixture Models for Survival Analysis of Email Data

Dr. Moumita Sinha and Dr. Vishwa Vinay, Adobe Research January 2017 - Present

- Devised a predictive model for time taken by a customer to open an email using Survival analysis.
- Used a mixture model to account for population heterogeneity in survival times. [WSDM 2018]

Time Series Forecasting of Web Traffic Metrics at Multiple Time Scales

Dr. Shiv Kumar Saini, Adobe Research July 2016 - December 2016

- Investigated a recurrent neural network architecture to forecast end of period values of time series, say daily revenue, from intra-period data, say hourly revenue.
- Model used for anomaly detection with confidence intervals estimated using bootstrap approach.

Online Recommendation of Diversified Lists

Dr. Branislav Kveton, Adobe Research January 2017 - Present

- Modeled the problem of personalizing recommendation lists to user interests with an objective of maximizing probability of a click on the list.
- Developed an online learning algorithm with provable guarantees that learns from click feedback.

Video Summarization with Memorability Objective

Dr. Sumit Shekhar, Adobe Research December 2016 - August 2017

- Designed and implemented a system to create memorable summaries of user-generated videos.
- Introduced a method for video memorability estimation using video semantics, saliency and color.
- Solved a submodular optimization problem to create video summaries, achieving accuracies at par with state-of-the-art methods. [ICCV Workshop 2017]

Machine Learning for Online Education

Dr. Shiv Kumar Saini, Adobe Research May 2017 - November 2017

- Developed a model for estimating knowledge state of students taking online assessments.
- Proposed a memory-augmented neural network trained jointly on two tasks, namely, students’ knowledge state prediction and hint-usage prediction.
- Demonstrated state-of-the-art performance on both tasks with AUC improvement of 2%.

Multi-View Learning for Customer Behavior Prediction

Dr. Atanu Sinha, Adobe Research; Prof. Niloy Ganguly, IIT Kharagpur May 2016 - August 2016

- Proposed a method to predict purchase behavior from customer activity on multiple channels.
- Used Deep Canonical Correlation Analysis to learn shared subspace from channel features.

INVITED TALKS

1. Algorithms for Churn Management in Email Marketing
 - **Adobe Symposium, Mumbai, India** May 2017
 - **Adobe Tech Summit, San Jose, CA, USA** February 2017
2. Embedding Nodes in Online Social Networks
 - **Indian Institute of Technology (IIT) Delhi** July 2015
 - **Graph Workshop, IBM India Research Laboratory** March 2015

PRESS COVERAGE OF WORK Churn Prediction in Email Marketing

- ‘Adobe wants to bring its AI smarts to email marketing campaigns’. **TechCrunch**. August 29, 2017. [Link]
- ‘Adobe Previews In-Development Features at Summit 2016’. **Techvibes**. March 25, 2016. [Link]

POSITIONS OF RESPONSIBILITY **Internship Project Supervisor**, Adobe Research

- Ritwick Chaudhry and Pradeep Dogga, *Personal assistants for online education*
- Neha Banerjee and Sahil Garg, *Optimal send time strategy for email campaigns*
- Stefanie Baby, Akash Gupta and Varun Rawal, *Multi-view learning for user behavior prediction*

Teaching Volunteer, Aarohan NGO

- Taught students from a government school supplementing their higher secondary education

Hostel Captain, BSA (Board for Sports Activities) IIT Delhi

- Led hostel Basketball team in inter-hostel tournaments finishing with Bronze medal in 2014

TECHNICAL SKILLS **Programming Languages:** (Proficient) Python, Java, R; (Familiar) C++, MATLAB, JavaScript
ML Frameworks: Tensorflow, Keras, Apache MXNet, Apache Spark, Numpy
Applications and Tools: L^AT_EX, Basic Bash Scripting, Git, MS Office

RELEVANT COURSES

Computer Science	Mathematics
Fundamentals of Machine Learning	Probability and Stochastic Processes
Neuroimaging Methods	Multivariate Statistical Methods
Analysis and Design of Algorithms	Optimization Methods and Applications
Data Structures	Linear Algebra
Programming Languages	Discrete Mathematics
Database Management Systems	Data Mining and Knowledge Discovery
Computer Architecture	Numerical Methods of Computation

REFERENCES Available upon request.