Swapneel Mehta

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EDUCATION

Ph. D. in Data Science, Center for Data Science, New York University, GPA 3.85 **2019 - Present**

- Probabilistic Programming, Causality, and Social Network Analysis.

Bachelor in Computer Engineering, University of Mumbai, GPA 9.23 **2014 - 2018**

- Applied Math, Graph Theory, Machine Learning, Artificial Intelligence, Algorithms

PROFESSIONAL EXPERIENCE

Visiting Researcher, Oxford University, United Kingdom **Aug '21 - Present**

- Leading collaboration between NYU CSMAP and the Torr Vision Lab.
- Detecting cliques of bad actors attempting to spread viral misinformation using simulation-based inference.
- Integrating social network simulations with recommender systems extending Gambardella et al., 2021.
- UKRI Grant Awarded to Prof. Philip Torr to support this work (details available on request).

Research Asst., Center for Social Media and Politics (CSMAP), New York **Feb '21 - Present**

- Analyzing the causal impact of Twitter's interventions on tweets spreading misinformation (e.g. Trump).
- Leading the development of SimPPL: Simulating Social Networks with Probabilistic Programs presented at Facebook (Probability org.) and Twitter (Cortex ML) in invited talks.
- Modeling policy interventions on spread of infections for COVID-19 as an analogy to misinformation control accepted at PROBPROG 2021, MIT.

Research Intern (Summer + Fall), Adobe Inc., San Jose **May - Dec '20**

- Trending Hashtag Recommendation for Videos; web-scraping, weakly-supervised learning, deep learning.
- Accepted a continuing offer to focus on scalability of graph neural networks, extending to personalized hashtag recommendation, working with the product team to deploy this feature. ***U.S. Patent App: P10634-US***.
- First-author paper accepted IEEE Intl. Symposium on Multimedia '21, user studies underway for productization.

Technical Student, European Org. for Nuclear Research (CERN), Geneva **Mar '18 - Jun '19**

- Built graph neural networks for particle track reconstruction using collision data from the Large Hadron Collider.
- Built and deployed the 'DeepJet' deep learning framework into production across ***42 global sites.***
- Used Tensorflow, Python, and custom C++ extensions for multithreaded operations in the CMS Software Env.
- Submitted first-author paper to ML for Open-source Software at NeurIPS 2018.

Openlab Intern, European Org. for Nuclear Research (CERN), Geneva **June '17 - Aug '17**

- Developed an ensemble of unsupervised learning models for anomaly detection in database connections.
- Published a first-author short paper, receiving a special mention in the machine learning track at 2nd Springer International Conference on Integrated Intelligent Computing, Communication, and Security, 2018.

Remote Research Intern, Dr. S. Sahasrabudhe, IIT-B, Mumbai **Aug '16 - May '17**

- Automated the evaluation for 3D Modeling assignments in Blender; Course Instructor for 'Skill Development in Animation' catering to over 5,000 participants on the IITBombayX platform; edX Prize Finalist, 2019.
- Published a first-author short paper at IEEE International Conference on Advanced Learning Technologies, 2018.

SWE Intern, Smokescreen Tech. (acq. by Zscaler Inc.), Mumbai **Nov '16 - Mar '17**

- Combined low-latency network scans, hostname clustering, intelligent decoys, and automated deployment using custom-built modules integrated into the NASSCOM-DSCI award-winning IllusionBlack software, 3rd Gen., 2017.
- Built a proof-of-concept honeypot with ICS/SCADA services responding on open ports in a FreeBSD 'jail' using open-source project 'Conpot'; mentored 2 interns from IIT-Bombay.

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SWE Intern, Falkonry Software Solutions, Mumbai **July '16 - Sept '16**

- Developed and deployed client API functionality to enable real-time data streaming and subscription-based alerts in the three client connectors released as open-source codebases in Java, Python and Javascript available publicly.
- Added tests for the primary product to support concurrency using multithreading and asynchronous calls.

Summer Intern, Microsoft Research, IIT Bombay, Mumbai **May '16 - July '16**

- Created a Google Analytics Dashboard to track and monitor user interactions on the "Lokacart" Android e-commerce application using the Enhanced E-commerce SDK.
- Presented the project to Microsoft Research and a committee of IIT-B faculty (video available: bit.ly/iitblokacart).

PUBLICATIONS / TALKS

Slides and Publications available at swapneelm.github.io/presentations and Google Scholar

- **Invited Talk, Twitter UK (Cortex Team), Dec. 2021**
  Social Network Simulation with Probabilistic Programs, joint work with CSMAP NYU and Oxford University

- **Invited Talk, Facebook AI Research (Probabilistic Programming Team), Nov. 2021**
  Social Network Simulation with Probabilistic Programs, joint work with CSMAP NYU and Oxford University

- **Panelist and Co-lead organizer, NYU AI School, 2019 - Present**
  Co-lead Organizer for 2022*, Co-organizer at NYU AI School 2021, Careers Panelist at NYC AI Workshop 2019.

- **Estimating the Causal Effect of Twitter's Interventions on Trump's Tweets,** S. Mehta, J. Bisbee, et al., (under internal review), 2021 extends Sanderson et al., 2021.

- **Open-domain Trending Hashtag Recommendation for Videos,** S. Mehta, et al., *IEEE International Symposium on Multimedia (ISM)*, 2021.

- **Modeling COVID-19 Infections and Policy Interventions with Probabilistic Programs,** S. Mehta and N. Kasmanoff, *International Conference on Probabilistic Programming (PROBPROG)*, MIT, 2021.

- **Tutorial on Probabilistic Programming,** Flatiron Institute's Computational Biology Group, July 2021.

- **Invited Talk on Interpretable Machine Learning,** BFS Reading Group, March 2021.

- **DeepJet: A Machine Learning Environment for High-energy Physics**, S. Mehta et al., 2018.
  Invited Poster Presentation at Nvidia GPU Tech Conference 2019, USA;
  Google Cloud Poster Award at the Deep Learning Indaba 2018, South Africa;
  Poster Presentation at the Machine Learning Summer School 2018, Spain;
  Invited Tutorial at the CMS Machine Learning Workshop, July 2018.
  Oral Presentation at the 2nd CERN IML Machine Learning Workshop, 2018;
  Invited Talk, CVIT Lab, International Institute of Information Technology (IIIT), Hyderabad, India.

- ***Best Paper,*** **A Big Data Architecture for Log Data Storage and Analysis**, S. Mehta, P. Kothuri, D. Garcia. *Integrated Intelligent Computing, Communication and Security*. Springer, Singapore, 2019.

- **Anomaly Detection for Network Connection Logs**, S. Mehta, P. Kothuri, D. Garcia. *ArXiv preprint arXiv:1812.01941,* 2018.

- **Reviewer**, Journal of Parallel and Distributed Computing (JPDC), October 2018.

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COMMUNITY INVOLVEMENT

- **Founder, Unicode Research, 2019 - Present:** Mentoring 15+ graduate and senior undergraduate students to conduct independent, collaborative research on causal inference, computer vision, probabilistic modeling, working with Dr. Akash Srivastava (MIT/IBM Lab). Created and taught a **Google Research India**-backed 10-week machine learning summer course for 100+ underrepresented Indian undergraduate students (group members).

- **Invited Talks, NYU Center for Data Science, 2020 - Present**
  Invited Panelist, 'So you want to go to Grad School', October 2021
  Invited Podcast, Graduate School, 2020; CERN, Data Science, and Ph.D., 2021
  Invited Panelist, Student Panel: Ph.D. Orientation, August 2021
  Invited Panelist, Student Careers Panel, March 2021

- **Co-founder, DJ Unicode, 2017 - Present:** Launched a student chapter undertaking open-source web and app (Android) development projects jointly mentoring a team of 210+ undergraduates achieving selections for Google Summer of Code, internships at CERN, and admission into Ivy Leagues for graduate school (website, GitHub).

- **Research Mentor, Lumiere Education (Harvard/Oxford), 2020 - Present:** Mentoring high-school students pursuing research on conversational AI, politics, and causal inference (webpage).

- **Contributor, Depth First Fellowship, Jane Street, 2018:** Participated in a 6-8 week discussion group with international researchers to create materials to explain Stein's Method in an accessible manner (webpage).

- **Mentor, The Grand Challenge, CERN/RCA, 2018:** Guided 4-5 teams of students from the Royal College of Art in London on leveraging AI/ML for designing sustainable solutions in science for The Grand Challenge.

- **Contributing Author, Open Source For You Magazine, 2017 - 20:** Featured articles on Artificial Intelligence and Machine Learning, the blockchain, Linux, Docker, Puppet, Windows, and tutorials on Jekyll, NodeJS, Git, among others reaching over 200,000 readers till date (website).

- **Course Instructor, Fundamentals of 3D Viz., IITBombayX, 2016:** Catered to an audience of over 5,000 learners. The course was recently selected as one of the Global edX Prize Finalists, 2019 (top 10 edX courses).

- **Machine Learning Lead, Stanford Scholar Initiative, 2016:** Led an international collaboration of students and researchers in building scientific talks to make state-of-the-art research more accessible (scholar.stanford.edu).

AWARDS/FELLOWSHIPS

- UKRI Research Grant Funding from Oxford University, 2021-22
- Google AI Research - Funding for Unicode's ML Summer Course, 2021
- IRIS-HEP Fellowship, 2020-21
- Center for Data Science Fellowship, 2019
- Norwegian Probabilistic AI School Scholarship (Fee Waiver), 2021
- Delegate at the Schonfeld Quant Conference, NYC 2019 (**15% acceptance**).
- **2nd Prize**, CodaLab Contest, Machine Learning in High-energy Physics Summer School, Oxford, 2018
- Economic Times Campus Stars Class of 2018 - Selected as one of **India's Top 33 Engineers**
- Stanford Graduate School of Business, Reliance Scholarship Finalist 2017 (**youngest finalist**; $150,000)
- Indian Academies of Science Fellowship, 2017
- HackDAIICT - 1st Runners-up; offer for incubation by Indian Space Research Organisation, 2017
- Computer Society of India TechNext Hackathon, IIT Bombay, Winners, 2017
- Chief Minister's Scholarship, **Top 1% candidates** in Higher Secondary Certificate (12th Grade), 2014