Vibhor Porwal

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EDUCATION

Indian Institute of Technology Kanpur Jul 2016 – Dec 2019
B.Tech. in Computer Science and Engineering
- CPI: 9.24 / 10

Sir Padampat Singhania Education Center, Kanpur, India Apr 2015 – May 2016
Class XII
- Percentage: 95.0%

RESEARCH EXPERIENCE

Adobe Research, Bangalore, India Aug 2020 – Present
Research Associate
- Working on projects in Causal Inference, Causal Discovery, and Approximate Query Processing in collaboration with various Product teams at Adobe.
- The research work has resulted in paper submissions, patents, and technology transfer to products.

National University of Singapore Jan 2020 – Feb 2020
Research Intern | Supervisor: Prof. Diptarka Chakraborty
- Worked on Approximating Edit Distance between two strings given in the compressed form.

Adobe Research, Bangalore, India May 2019 – Jul 2019
Research Intern | Supervisor: Dr. Vishwa Vinay
- Worked on offline evaluation of a search ranker using behavioral data collected by the search engine.
- Implemented and compared various counterfactual and regression based offline evaluation methods.
- Used Adobe Stock and Yandex search engine dataset for experimentation.

PAPERS

[1] Vibhor Porwal, Piyush Srivastava, Gaurav Sinha, "Almost Optimal Universal Lower Bound for Learning Causal DAGs with Atomic Interventions," *Under Review*, Nov 2021. arxiv:2111.05070.

PATENTS

[1] Iftikhar Ahamath Burhanuddin, Koyel Mukherjee, Vibhor Porwal, Rebin Silva Valan Arasu, Jonathan Vance, Satya Gadikoyila, Meenakshi CS, "Data Story Generation from Tabular Data and a User Specified Query," *Approved for Filing*, Sep 2021.

[2] Vibhor Porwal, Ayush Chauhan, Aurghya Maiti, Gaurav Sinha, Ruchi Pandya, "Systems for Estimating Terminal Event Likelihood," *US Patent*, Filed on 16 Aug 2021.

SCHOLASTIC ACHIEVEMENTS

- Received Academic Excellence Award thrice at IIT Kanpur for outstanding academic performance.
- Country Rank 120 in JEE(Advanced)-2016 among 150,000 candidates.
- Country rank 1123 in JEE(Mains)-2016 among 1.1 Million candidates.
- Country Rank 277 in KVPY-2015 conducted by IISc Bangalore.
- Received Senate Scholarship at IIT Kanpur awarded to a few meritorious students from each batch.

RESEARCH PROJECTS

Robust Learning of Causal Bayesian Networks Oct 2021 – Present
Supervisor: Dr. Gaurav Sinha
- Working on the problem of learning a Causal Bayesian Network with known structure when an adversary can corrupt a fraction of both observational and interventional samples.

Causal Graph Learning using Interventions Aug 2020 – Present
Supervisor: Prof. Piyush Srivastava & Dr. Gaurav Sinha Paper
- Surveyed the existing literature on algorithms and lower bounds for causal graph learning using interventions in both adaptive and passive settings.
- Proposed a new universal lower bound on the number of atomic interventions required to learn a causal graph, which is provably better than the previously known universal lower bound.
- Working on extending our techniques to discover better causal graph learning algorithms.

Approximate Query Processing Aug 2020 – Present
Supervisor: Dr. Subrata Mitra
- Worked on sampling and machine learning based methods for query approximation on large datasets.
- Proposed a new method to reduce approximation error for queries with a large number of predicates.

- Currently working on sampling techniques for the approximation of complex queries with JOINs.

Lower Bounds for Graph Streaming Algorithms Aug 2019 – Dec 2019
Supervisor: Prof. Raghunath Tewari

- Surveyed the state of the art bounds for graph problems such as Min-Cut, Directed Connectivity, Maximum Matching, etc., in the streaming model.
- Proposed multi-pass space lower bounds for Maximum Weighted Matching and Shortest Path problems in the turnstile streaming setting.

Motion Planning with Probabilistic Guarantee Jan 2019 – Apr 2019
Supervisor: Prof. Indranil Saha Book Chapter

- Studied the problem of designing a control strategy for a robot to maximize the probability of satisfying certain specifications formulated as LTL or PCTL formulas.
- Surveyed the current state of the art algorithms for this problem in discrete as well as continuous time dynamic environments and co-authored a book chapter on this topic.

Smallest Enclosing Circle Jul 2018 – Nov 2018
Supervisor: Prof. Surender Baswana Presentation

- Reinvented an incremental randomized algorithm with expected $O(n)$ time complexity for finding the smallest enclosing circle of n points in a $2D$ plane.
- Implemented this algorithm in C++ using the LEDA library and experimentally analyzed it.

COURSEWORK

- Data Structures and Algorithms
- Theory of Computation
- Randomized Algorithms
- Probability and Statistics
- Logic in Computer Science
- Algorithms-II
- Computational Complexity
- Compiler Design
- Discrete Mathematics
- Linear Algebra
- Machine Learning
- Quantum Computing
- Stochastic Processes
- Abstract Algebra
- Database Systems

TALKS

- Applications of Communication Complexity in Streaming Algorithms, IIT Kanpur Presentation

MENTORING EXPERIENCE

- Co-mentored undergraduate interns for projects on “Learning from Label Proportions” and “Data Summarization and Storytelling” at Adobe Research.
- Taught the basics of Graph theory and Probability theory to undergrads as part of ACA, IIT Kanpur.
- Took extra classes and provided one-to-one mentoring to first-year undergraduate students as an Academic Mentor of a Physics course at IIT Kanpur.

PROGRAMMING LANGUAGES C, C++, Python