Shubhranshu Shekhar
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Appointments

Brandeis University — Waltham, MA
Assistant Professor of Data Science — *7.2023 - Present*

Flipkart — Bengaluru, India
Data Scientist — *7.2015 - 7.2017*

Infosys — Bengaluru, India
Systems Engineer — *7.2010 - 7.2012*

Education

Carnegie Mellon University — Pittsburgh, PA
PhD in Machine Learning and Public Policy — *Jan 2019 – May 2023*

Coursework: Advanced Introduction to Machine Learning, Intermediate Statistics, Statistical Machine Learning, Causal Inference, Convex Optimization, Human Judgment and Decision Making

Advisors: Prof. Leman Akoglu and Prof. Christos Faloutsos

PhD in Information Systems (transitioned to joint program) — *Fall 2018*

MS in Machine Learning Research — *May 2023*

Indian Institute of Technology Madras — Chennai, India
MS (by Research) in Computer Science and Engineering (defense, Jan 2019) — *Jun 2015*

Selected Coursework: Natural Language Processing, Kernel Methods for Pattern Analysis, Social Network Analysis, Artificial Intelligence

National Institute of Science and Technology — Berhampur, India
BTech in Computer Science and Engineering — *Jun 2010*

Awards and Honors

- NBER Center for Aging and Health Research **Data Pilot Grant** with Lowell Taylor, Jetson Leder-Luis, and Leman Akoglu, 2022.
- CMU GSA/Provost Conference Funding, 2022.
- **Duncan Award** for best second research paper (PhD candidacy) at Heinz, CMU 2021
- Runner-up, **Best Student Machine Learning Paper Award** at ECML PKDD 2018
- Our team IITM was ranked in top 10 in ACM RecSys Challenge 2014

Publications

Refereed Publications

1. Meng-Chieh Lee, Shubhranshu Shekhar, Jaemin Yoo, and Christos Faloutsos. "NetEffect: Discovery and Exploitation of Generalized Network Effects." In *PAKDD*, 2024.
2. Lalithsai Posam, Shubhranshu Shekhar, Meng-Chieh Lee, and Christos Faloutsos. "DiffFind: Discovering Differential Equations from Time Series." In *PAKDD*, 2024.

3. Jaemin Yoo, Meng-Chieh Lee, Shubhranshu Shekhar, Christos Faloutsos. "Less is More: SlimG for Accurate, Robust, and Interpretable Graph Mining." In *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2023.
4. Shubhranshu Shekhar, Dhivya Eswaran, Bryan Hooi, Jonathan Elmer, Christos Faloutsos, and Leman Akoglu. "Benefit-aware Early Prediction of Health Outcomes on Multivariate EEG Time Series." *Journal of Biomedical Informatics*, 2023.
🏆 *George Duncan Award for PhD 2nd Paper at Heinz College.*
5. Meng-Chieh Lee*, Shubhranshu Shekhar*, Christos Faloutsos, T. Noah Hutson and Leon Iasemidis. "GEN^{2}OUT: Detecting and Ranking Generalized Anomalies." In *IEEE International Conference on Big Data (Big Data),* 2021.
6. Shubhranshu Shekhar, Neil Shah and Leman Akoglu. "FAIROD: Fairness-aware Outlier Detection." In *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2021.
7. Shubhranshu Shekhar, Deepak Pai and Sriram Ravindran. "Entity Resolution in Dynamic Heterogeneous Networks." In Workshop on *Deep Learning for Graphs at The Web Conference (WWW)*, 2020.
8. Shubhranshu Shekhar and Leman Akoglu. "Incorporating Privileged Information to Unsupervised Anomaly Detection." In *ECML-PKDD* 2018. 🏆 *Best Student Machine Learning Paper, runner-up.*
9. Shubhranshu Shekhar, Sutanu Chakraborti, and Deepak Khemani. "Spreading Activation Way of Knowledge Integration." In *MIKE*, 2015
10. Avijit Saha, Janarthanan Rajendran, Shubhranshu Shekhar and Balaraman Ravindran. "How popular are your tweets?". In Workshop on *Crowdsourcing and Human Computation for Recommender Systems at RecSys*, 2014
11. Shubhranshu Shekhar, Sutanu Chakraborti, and Deepak Khemani. "Linking Cases Up: An Extension to the Case Retrieval Network." In *ICCBR*, 2014.

PREPRINT AND WORK IN PROGRESS

10. Shubhranshu Shekhar, Jetson Leder-Luis, and Leman Akoglu. "Unsupervised Machine Learning for Explainable Healthcare Fraud Detection." *NBER Working Paper*, 2023. (***Job market paper***)
11. Shubhranshu Shekhar and Leman Akoglu. "SETSPOT: Deep Set Anomaly Detection." *Under review.*
12. Shubhranshu Shekhar, Meng-Chieh Lee, and Christos Faloutsos. "Seizure Detection in Multivariate EEG Time Series." *Under preparation.*

PATENTS

1. Shubhranshu Shekhar, Deepak Pai and Sriram Ravindran. "Utilizing a Time-dependent Graph Convolutional Neural Network for Fraudulent Transaction Identification." *US Patent 11,403,643.*
2. Moein Saleh, Xing Ji, Shubhranshu Shekhar. "Machine Learning based on Post-Transaction Data." *US Patent 11,321,632.*

TEACHING

Brandeis University Waltham, MA

Instructor

- **BUS 241A**: Machine Learning
- **BUS 111A**: Business Analytics
- **BUS 215 F**: Programming for Business

CMU Pittsburgh, PA

Instructor

- **Machine Learning for Problem Solving**: Most popular graduate level ML course at policy school.
Spring'20

Teaching Assistant

- **Introduction to Machine Learning (PhD)**: Most popular graduate ML course at the university. *Fall'18*
- **Machine Learning for Problem Solving**: Graduate ML course. *Spring'19*
- **Intermediate Statistics**: Graduate statistics course for Information Systems students. *Fall'19*

Internship Experience

Adobe San Jose, CA

Data Science Intern *May 2019 - Aug 2019*

- **Fraudulent Actor Linking**: Developed an inductive embedding technique for time-evolving graphs to find similar fraudulent actors. Represented user activity logs as graphs. *(1 patent filed and 1 paper published at WWW.)*

PayPal San Jose, CA

PhD Machine Learning Intern *May 2018 - Aug 2018*

- **Fraud Detection**: Developed a new fraud detection model for ACH fraud. Designed an algorithm where past transactions guide the learning through instance weighting. *(1 patent filed.)*

Service

Reviewer/External Reviewer: DAMI 2024, INFORMS 2023, CHIL 2024, 2023, 2022, 2021, FAccT 2023, SIGKDD 2022, 2020, TPAMI 2023, 2019, 2018, CIKM 2020, 2018, AAAI 2016

Skills

Programming Languages: Python, Java, Scala, MATLAB

Frameworks and Tools: sk-learn, PyTorch, Keras, Spark, Cascading, Pig, Hive