Deepak Maurya

Personal Data

Research Interests: Theoretical Machine Learning
web page: https://d-maurya.github.io
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Education

2021 - Present	**Purdue University**, PhD in Computer Science Advisor: Dr. Jean Honorio
2018 - 2021	**Indian Institute of Technology**, Madras, Chennai, India Master of Science in Computer Science & Engineering Thesis: Spectral Hypergraph Theory Advisors: Prof. Balaraman Ravindran, Prof. Shankar Narasimhan
2011-2016	**Indian Institute of Technology**, Madras, Chennai, India M.Tech & B.Tech - Dual Degree in Electrical Engineering Thesis: Identification of Linear Dynamic Systems using Dynamic Iterative PCA Advisors: Prof. Arun K. Tangirala, Prof. Shankar Narasimhan

Awards

- Best Student Paper at Indian Control Conference 2019
- Travel grant of $500 and student registration of $490 to attend KDD 2019
- Travel grant to attend CoDS-COMAD 2020 and ICC 2019, covering all expenses

Relevant Coursework

- Hands on Learning Theory
- Randomized Algorithms
- Linear Algebra and Random Processes
- Probability, Statistics and Stochastic Process
- Nonlinear optimisation: Theory and algorithms
- Multivariate Data Analysis
- Applied Time Series Analysis
- System Identification
- Introduction to Machine Learning
- Probabilistic Graphical Models

Service

- Teaching assistant for CS 578: Statistical Machine Learning during Spring 2022 and for CS 314: Numerical Methods during Fall 2021 at Purdue University.
- Teaching assistant for a MOOC course on Introduction to ML offered on NPTEL during July-Oct 2019, Jan-Apr 2020, and July-Dec 2020 enrolled by 20K, 30K, and 40K students respectively.
- Teaching assistant for course on Introduction to Research offered at IIT Madras during Jan-May 2019 semester.
- Co-organizer for Graphs & more Complex structures for Learning & Reasoning (GCLR) workshop held at AAAI 2021 and AAAI 2022.
- Volunteer for AAAI 2021, AISTATS 2021, and CoDs-COMAD 2021.
- Reviewer for ECML-PKDD 2020, ACODS 2018, 2020, ADCOM 2018, ICC 2019.

Publications

6.1 Accepted

1. Identification of Errors-in-Variables ARX Models Using Modified Dynamic Iterative PCA, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, Journal of the Franklin Institute, 2022, [Paper]
2. Dynamic Iterative Principal Components Analysis for Closed-loop, Model Identification, FAC-PapersOnLine, 55(1):393-8, Richa Katare, **Deepak Maurya**, Ravindra D Gudi, ACODS 2022, [Paper].

3. Hyperedge Prediction using Tensor Eigenvalue Decomposition, **Deepak Maurya**, Balaraman Ravindran, Journal of the Indian Institute of Science, 101(3):443-53, [Paper].
4. ARX Model Identification using Generalized Spectral Decomposition, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, To appear in 24th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2020), [Paper]
5. Optimal Filtering and Residual Analysis in Errors-in-variables Model Identification, Vipul Mann, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan. Industrial & Engineering Chemistry Research. 2020;59(5):1953-65. [Paper], [Code]
6. Identification of MISO Systems in Minimal Realization Form, Chaithanya K. Donda, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, IFAC-PapersOnLine, 53(1), pp.141-146, [Paper]. [Slides].
7. Identification of Output-Error (OE) Models using Generalized Spectral Decomposition, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, In Fifth Indian Control Conference (ICC 2019) (pp. 28-33), IEEE. Won the Best Student Paper Award. [Paper], [Code], [Slides]
8. Identification of Errors-in-Variables Models Using Dynamic Iterative Principal Component Analysis, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, Industrial & Engineering Chemistry Research. 2018;57(35):11939-54. [Paper], [Code]
9. Identification of Linear Dynamic Systems using Dynamic Iterative Principal Component Analysis, **Deepak Maurya**, Arun K. Tangirala, Shankar Narasimhan, IFAC-PapersOnLine, 49(7), pp.1014-1019. [Paper], [Code], [Slides]

6.2 Manuscript Under Preparation / Submission

1. Hypergraph Partitioning using Tensor Eigenvalue Decomposition, **Deepak Maurya**, Balaraman Ravindran, [arXiv link]
2. An Efficient Certification of Graph Isomorphism on Selected Graph Classes, **Deepak Maurya**, Balaraman Ravindran, Srinivasan Parthasarathy

Industrial Experience

Data Scientist
July to Nov 2016

Mad Street Den, Chennai, Mentor: Dr. Aravindakshan Babu
Key Performance Indicators - Predictiors and Optimizers
Prediction of multiple key performance indicators (KPIs) like the number of page-views, add-to-carts for any e-commerce website. We implemented various efficient and scalable time series models using data tables package in R. This helped us to improve user engagement and the number of products bought from the e-commerce website.

Project Associate
May to Dec 2017

IIT Madras, Chennai, Mentor: Prof. Raghunathan Rengaswamy
Aluminium Smelting Furnace
Trained a classification and regression model to predict the pot leaks and temperature inside an aluminum smelting furnace, which has been successfully deployed. It helped us to reduce the downtime of furnace and hence enhance profitability. This project was done in collaboration with General Electric Global Research.

Scholastic Achievements

- All India Rank in **top 0.64%** in AIEEE 2011 attempted by **1.12M** candidates.
- All India Rank in **top 0.92%** in IIT-JEE 2011 attempted by **485K** candidates.
- All India Rank 451 in **top 0.36%** in GATE 2015 attempted by **126K** candidates.