HARDIK PRABHU — CURRICULUM VITAE

Research Associate – Robert Bosch Centre for Cyber-Physical Systems
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RESEARCH INTERESTS

My research interests are centred around the intersection of generative modelling, interpretability, and deep learning techniques.

EDUCATION

Chennai Mathematical Institute (CMI) — **Chennai, India**
Master of Science in Data Science, CGPA : 8.38/10 — *Aug 2019 - May 2021*

D.G Ruparel College, Mumbai University — **Mumbai, India**
Bachelor of Science in Mathematics, CGPA : 8.75/10 — *Aug 2016 - April 2019*

EXPERIENCE

CloudAEye, Inc. — **Fremont, CA, USA (remote)**
Machine Learning Researcher — *July 2024 - Present*

- Rejoined CloudAEye as an ML Researcher.

Indian Institute of Science (IISc) — **Bengaluru, India**
Research Associate — *Nov 2023 - June 2024*

- Focused my research on applying deep generative modelling in Energy Informatics.
- Led a project on applying GANs in energy anomaly detection.
- Authored a paper on the findings as first author, which was presented at the AI4TS (Artificial Intelligence for Time Series) workshop at the AAAI 24 (Association for the Advancement of Artificial Intelligence) conference.

FLAME University — **Pune, India**
Research Associate — *Jan 2023 - Nov 2023*

- Led projects focusing on multiple areas including Explainable AI and Genetic Algorithms.
- Served as a Teaching Assistant for courses related to Computational Modelling, Quantitative Methods and Machine Learning.
- Actively mentored undergraduate students on their research projects, and guided them in the development and realization of their ideas.
- Produced 2 Q1 journal papers, an ACM BuildSys workshop paper, and a Springer book chapter as first author.

CloudAEye, Inc. — **Fremont, CA, USA (remote)**
Machine Learning Engineer — *July 2021 - Oct 2022*

- Developed and deployed advanced deep learning and machine learning solutions specializing in anomaly detection within logs and metrics produced by cloud-native applications.
- Utilized deep learning techniques such as LSTMs, Variational Autoencoders (VAEs) and Normalizing Flows.
- Additionally, developed a root cause localization method utilizing a PageRank-like algorithm for faults occurring in microservices interacting within intricate network architectures.

○ Conducted technical interviews to assess the proficiency of candidates applying for the ML Engineer role.

CMI Algolabs **Chennai, India**
Research Intern *May 2020 - Aug 2020*
○ Created a Python-based tool for a software company for mapping functionality script to software documentation by applying Latent Dirichlet Allocation, a topic modelling technique.

RESEARCH PUBLICATIONS

Refereed Conference and Workshop papers

[C.1] **Prabhu, H.**, Valadi, J.K. and Arjunan, P., Generative Adversarial Network with Soft-Dynamic TimeWarping and Parallel Reconstruction for Energy Time Series Anomaly Detection. In Proceedings of AI4TS workshop of AAAI, 2024 (**CORE Rank: A***)

[C.2] **Prabhu, H.**, Valadi, J.K. and Arjunan, P., Explainable AI for Energy Prediction and Anomaly Detection in Smart Energy Buildings. In Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation.(pp. 472-475).(**CORE Rank: A**)

[C.3] **Prabhu, H.** and Arjunan, P., 2022, November. eptk: energy prediction toolkit. In Proceedings of the 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation. (pp. 512-515).(**CORE Rank: A**)

Refereed Journal Articles

[J.1] **Prabhu, H.**, Bhosale, H., Sane, A., Dhadwal, R., Ramakrishnan, V., and Valadi, J. 2024. Protein Feature Engineering Framework for AMPylation Site Prediction. Nature Scientific Reports. (**SCI IF: 4.6, Q1**)

[J.2] **Prabhu, H.**, Sane, A., Dhadwal, R., Parlikkad, N.R. and Valadi, J.K., 2023. Interpretation of Drop Size Predictions from a Random Forest Model Using Local Interpretable Model-Agnostic Explanations (LIME) in a Rotating Disc Contactor. Industrial & Engineering Chemistry Research. (**SCI IF: 4.326, Q1**)

Book Chapters

[B.1] **Prabhu, H.**, Sane, A., Dhadwal, R., Siarry, P., Valadi, J. (2024). Metaheuristic and Evolutionary Algorithms in Explainable Artificial Intelligence. In: Valadi, J., Singh, K.P., Ojha, M., Siarry, P. (eds) Advanced Machine Learning with Evolutionary and Metaheuristic Techniques. Computational Intelligence Methods and Applications. Springer, Singapore.

TEACHING EXPERIENCE

- **Teaching Assistant, FLAME University:** Research Methodology, Quantitative Methods (Oct 2023 - Nov 2023)
  Conducted classroom lectures for PhD students in social sciences, focusing on the introduction to statistics, including topics on sampling, parameter estimation, and hypothesis testing.
- **Teaching Assistant, FLAME University:** CSIT 331, Machine Learning I (Jan 2023 - May 2023)
  Delivered engaging classroom lectures and interactive tutorials covering a range of topics, including fundamental introduction to statistics, comprehensive discussions on Decision Trees and Clustering Algorithms, and coding tutorials.
- **Teaching Assistant, FLAME University:** CSIT 121, Computational Modeling (Jan 2023 - May 2023)
  Delivered engaging classroom lectures and interactive tutorials on optimization using gradient descent algorithm.

CERTIFICATION AND SKILLS

Custom Models, Layers, and Loss Functions with TensorFlow

Cerificate Issued by DeepLearning.AI *Jan 2022*

Custom and Distributed Training with TensorFlow
Cerificate Issued by DeepLearning.AI *August 2022*

Programming Languages: Python, R and LaTeX

Python Packages: Pytorch, Tensorflow, Scikit-learn, Numpy, Pandas, Pymoo.

Relevant Graduate Coursework: Advanced Machine Learning, Bayesian Data Analysis, Multivariate Statistics, Reinforcement Learning.

REFERENCES

- **Dr. Pandarasamy Arjunan** (Research advisor)
  Assistant Professor, Robert Bosch Centre for Cyber-Physical Systems (RBCCPS), Indian Institute of Science, Bengaluru, India
  samy@iisc.ac.in
- **Dr. Jayaraman Valdi** (Research Advisor)
  Distinguished Professor, Department of Computing and Data Sciences,
  FLAME University, Pune, India
  jayaraman.vk@flame.edu.in
- **Dr. Venkatesh VinayakaRao** (Graduate Research Advisor)
  Visiting Faculty, Data Science, Chennai Mathematical Institute, Chennai, India
  venkateshv@cmi.ac.in
- **Nazrul Islam** (Industry Mentor)
  CEO and Founder, Cloudaeye, Fremont, USA
  nazrul@cloudaeye.com