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

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

- Currently focused on applying Deep Generative Modelling in Energy Informatics.

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

- Led projects focusing on multiple areas including Explainable AI, Generative Modelling, 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.

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 24, 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.**, 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**)

Accepted for Publication

[J.2] **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, Accepted. (**SCI IF: 4.6, Q1**)

Book Chapters

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

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