Amey Varhade

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EDUCATION

Indian Institute of Technology Guwahati　　　　　　　　　　　　**Jul 2018 - Jun 2022**
B.Tech in Computer Science and Engineering (Major), Product Design (Minor)　　　　*Guwahati, India*

Relevant coursework:
Data Structures, Algorithms, Linear Algebra, Probability, Number Theory, Discrete Mathematics, Machine Learning, Deep Learning, Data Mining, , Operating Systems, Databases, Programming Languages, Parallel Computing.

PUBLICATIONS

RI-MAC: Optimising MAC Operation using Custom RISC-V Instruction Set for Neural Network Inference
Imljungla Longchar, Kaustubh Khutal, Aswath Reddy, **Amey Varhade**, Hemangee K Kapoor
International Conference on AI-ML Systems **(AIMLSys 2025)**

Can Physics informed Neural Operators self improve?
Ritam Majumdar, **Amey Varhade**, Shirish Karande, Lovekesh Vig
*DLDE-III Workshop **(Spotlight Talk)**, Neural Information Processing Systems* **(NeurIPS-W 2023)**

CluSpa: Computation Reduction in CNN Inference by exploiting Clustering and Sparsity
Chetan Ingle, Imljungla Longchar, **Amey A Varhade**, Saurabh Baranwal, Hemangee K Kapoor
International Conference on AI-ML Systems **(AIMLSys 2022)**

EXPERIENCE

Microsoft Research　　　　　　　　　　　　　　　　　　　　**Sep 2024 - Present**
Research Fellow

- Researching algorithmic improvements to Approximate Nearest Neighbour (ANN) indexing and search methods, including enhancements to Microsoft's DiskANN algorithm, and developing a novel clustering-cum-indexing approach leveraging ANN techniques.
- Leading the design and development of a large-scale synthetic workplace email and document dataset to evaluate, benchmark, and improve M365 Copilot (Agentic RAG and DeepResearch) systems.

IBM (India Software Labs)　　　　　　　　　　　　　　　　　**Sep 2022 - Sep 2024**
Software Engineer

- Worked on the Control Plane of the Overlay Network (SDN) for IBM Virtual Private Cloud (VPC) Offering.
- Collaborated with IBM Research on Retrieval Augmented Generation (RAG) for code generative models for Ansible.

Google Summer of Code (GSoC)　　　　　　　　　　　　　　　**Jun 2021 - Aug 2021**
Prof. Brad Marston, Brown University, Machine Learning for Science (ML4SCI) Organization　　　*git.io/JuXQr*

- Applied **dimensionality reduction** techniques such as Proper Orthogonal Decomposition (**POD**) to analyse the data.
- Generated large-scale fluid motion data from solving **Navier Stokes equation** with spectral methods.

Citrix　　　　　　　　　　　　　　　　　　　　　　　　**Apr 2021 - Jun 2021**
Software Developer Intern, Cloud and Networking Team

- Designed a solution for the **Canary Deployment** and **Blue-Green Deployment** of Kubernetes based applications.
- Employed Citrix ADC VPX as the Load Balancer for the application deployment on Azure Kubernetes Services (**AKS**).

Columbia University　　　　　　　　　　　　　　　　　　　**Jul 2020 - Aug 2020**
Research Intern, Shirish Singh, Programming Systems Lab, Department of Computer Science

- Investigated privacy threats by **side channel attacks** on smartphone device sensors, particularly the **magnetometer**.
- Analyzed the **user locations** and performed fingerprinting of the **user activity** using KNN, SVM and Random Forest.

PROFESSIONAL SERVICES

Reviewer: NeurIPS'25 D&B Track, ICML'25, ICLR'25, AISTATS'25, NeurIPS'24, ACL(ARR)

Technical Skills

- **Programming Languages**: Python, C, C++, Go, Bash
- **Technologies/Tools:** Docker, Kubernetes, MATLAB, Git, MySQL, IBM Cloud, Azure
- **Frameworks/Libraries:** PyTorch, Keras, Huggingface, Scikit-learn, OpenCV, Plotly

Selected Projects

Incremental Co-clustering of Documents and Words   Jan 2021 - Apr 2021
Data Mining Course Project, Prof. Amit Awekar, Department of CSE, IIT Guwahati   *git.io/JqGnS*

- Implemented the ***Spectral Graph Bipartitioning*** algorithm in **C++** and Armadillo and achieved at par results.
- Devised an incremental version of the algorithm reducing computation time by **60%** and improving the purity metric.

CDR/IPDR Data Visualizer   Mar 2020 - Aug 2020
Smart India Hackathon, Software Edition (Bureau of Police R&D)   *git.io/JJil4*

- Developed a **Dash** web application for call and internet data with predictive filtering options through a callback model.
- Displayed interactive visualizations and corresponding real time statistics through **Plotly** and **NetworkX** of the users.

Accelerators for Convolutional Neural Networks   Jul 2021 - May 2022
Bachelor's Thesis Project, Prof. Hemangee Kapoor, Department of CSE, IIT Guwahati

- Explored the algorithmic and architecture-based optimization techniques for training and inference of Neural Networks.
- Implemented a technique for the efficient inference of **CNNs** by exploiting the model structure, in **PyTorch**.

Scholastic Achievements

ACM ICPC: Achieved National Rank of **657** in the Amritapuri Region Preliminary Round.	2021
Facebook Hacker Cup: Qualified for the Round 2 of the competition.	2021
Smart India Hackathon: Shortlisted among top **5** teams nationally for Grand Final Round.	2020
KVPY: Offered the KVPY fellowship twice for streams SA and SX by Government of India	2016, 2017
RMO: Qualified the Pre-RMO examination and selected to appear for RMO twice.	2014, 2015