

VIKAS KALAGI

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EDUCATION

University of California, Santa Barbara - Santa Barbara, CA, USA | Sep 2024 - May 2026

Master of Science in Computer Science | CGPA - 4.0/4.0

PES University - Bangalore, India | Aug 2017 - May 2021

Bachelor of Technology in Computer Science and Engineering | CGPA - 9.03/10

SKILLS

Languages: C, CPP, Python, Swift, JavaScript, Java

APIs: Vulkan APIs, CUDA, OpenMp, OpenCL, Rest APIs

Tools: Intel Vtune, Visual Studio, Xcode, Git, Ngnix, CMAKE

Cloud & ML: TensorFlow, PyTorch, Keras, AWS, Microsoft Azure

PUBLICATIONS AND ACHIEVEMENTS

Publication: Published in Very Large Database (VLDB) 2023 conference for research titled "A Case for Graphics-Driven Query Processing".

EXPERIENCE

Microsoft Research India (MSRI) - Bangalore, India | Aug 2022 - July 2024

Research Fellow

- Accelerated database queries using GPUs, specifically applying graphics pipeline architecture to tackle portability and scalability issues of GPUs.
- Implemented "Join" and "GroupBy" database operators with core graphics primitives, achieving 2x performance improvement over existing methods.
- Integrated advancements such as pipelining techniques, hybrid hash-based and radix-based partitioning, and bitwise compression to optimize data transfer to GPUs.
- Achieved 3.2x performance improvement in Azure SQL Server's GroupBy operator.

MakeMyTrip - Bangalore, India | June 2021 - Aug 2022

Software Engineer

- Developed iOS features using Swift and Model View Presenter(MVP) architecture.
- Built features for the Goibibo app, including "GoTribe" (travel Q&A) and "Trip Money" (payment tool).
- Boosted iOS app performance by implementing advanced caching solutions, reducing data fetch latency and app load times by 30%, ensuring a seamless user experience.

Indian Institute of Science (IISc) - Bangalore, India | Jan 2021 - June 2021

Research Intern

- Developed a hybrid CPU-GPU algorithm for maximum bipartite matching and multi-GPU solutions using NVIDIA V100 cores.
- Optimized performance with NVLink for direct data transfer and improved SIMT efficiency on V100 GPUs.
- Achieved 32% faster performance compared to CPU-only execution.

PROJECTS

Deep Learning - Covariance - Driven Graph Embedding for Real-Time Traffic State Prediction | Sep 2024 – Dec 2024

- Developed a traffic forecasting model utilizing temporal graphs and transformer-based attention mechanisms to capture spatial-temporal dependencies.
- Enhanced prediction accuracy by dynamically updating weights through eigenvalue decomposition and cosine similarity for adaptive feature selection.

Operating System - FileSystem | Sep 2024 – Dec 2024

- Built a fully functional ext-4 Linux filesystem from scratch using the FUSE (FileSystem in Userspace) library, enabling seamless integration with the operating system.
- Implemented mount and unmount functionality for the custom filesystem, ensuring reliable and efficient management of file system operations in a user-space environment.
- Optimized filesystem performance by implementing block-level caching and read-ahead techniques, reducing disk I/O latency and enhancing data retrieval speed for high-throughput operations.

Deep Learning - Converting Kannada Dialects into Standard Kannada Language | July 2020 – Dec 2020

- Introduced a Cyclic-GAN approach for dialect conversion from audio Kannada dialects to standard Kannada.
- Created an extensive audio dataset for Kannada dialects.
- Implemented dialect detection using Long Short-Term Memory (LSTM) model, achieving 85% test accuracy.

Data Structures and Algorithms - Automatic Timetable Generation for University | June 2019 – July 2019

- Developed a solution to the NP-hard problem an automatic timetable generation.
- Addressed University constraints, such as specific teacher slots and guest lecturer availability, to produce conflict-free timetables and generated the timetable using my university data.
- Utilized Python, PHP for web UI, basic web development for UI design, and PostgreSQL as the database.