LOKESH KOSHALE | CS15B049
Indian Institute of Technology Madras

EDUCATION

Program	Institution	%/CGPA	Year of completion
Dual Degree CSE (B.Tech + M.Tech)	Indian Institute of Technology Madras	7.59	2020
XII (CBSE)	Jawahar Navodaya Vidyalaya, Raipur	93.80	2014

SKILLS

- Languages (Technical): C, C++, CUDA, Java, Python, Scala, HDL, x86 assembly, Bluespec
- Frameworks and APIs: OpenMP, MPI, SPARK, Tensor-flow, OWL
- Databases: SQL, Object Database, XML databases (XQuery), RDF (Sparql)

PROFESSIONAL EXPERIENCE

Algorithms and AI Intern at KLA, Chennai (December 2019 - Current)
- Modelling and Implementing, parallel algorithms for Auto Segmentation and Feature Selection.
- Analyzing performance bottlenecks and optimizing parallel algorithms for the target hardware.
- Effectively managed the workload and time for the final semester, dual degree project and the work assigned.

Algorithm Intern at KLA, Chennai (Summer 2019)
- Implemented parallel Inference and Sampling algorithms on GPU, achieved 2x-8x speedup than OpenMP.
- Scaled up the GPU programs using SPARK 2.1 framework for multi-node/multi-GPU systems.

Software Intern at eClerx, Mumbai (Summer 2018)
- Object detection and localization in Image using CNN, achieved 88% accuracy on the custom dataset.
- Designed and developed an algorithm to verify websites from pdf-based wireframes using OCR.

Android Developer at Machadalo (IITB startup), Mumbai (Summer 2017)
- Developed an Image Auditing mobile application to capture images, verify and upload in the server on Android.
- Used OpenCV for image matching and feature matching to catch fraudulent images in the database.

PROJECTS

- **A* algorithm for Dynamic Graphs on GPU** (2019 - ongoing)
  - Built a framework for parallel dynamic A* which handles insertions, deletions, and fully-dynamic operations.
  - Proved cruicial properties of the dynamic computation, which allowed to implement synchronization effectively.
  - Achieved 24x-54x speedup than static A* for SNAP datasets on 100 batch updates.
  - Applied the framework to different applications of A*: wireless sensor networks, path planning, and game trees.
- **Sparse Tensor Transpose Operation on GPU**. (2018)
  - Parallelized Tensor Transpose operation on GPU, achieved coalesced memory access for both input and output tensor.
  - Performance improvement persists with varying ranks, varying permutations and varying index ranges.
- **ABySS GENOME Assembler on GPU**. (2018)
  - Parallel de-novo assembling of reads into genome sequence and optimized contig formation.
  - Modified data-structure to reduce 10x space and achieved 6x-8x speedup as compared to OpenMP.
- **Lock Contention aware Scheduler for NUMA architecture** (2017)
  - Implemented *shuffling*, which migrates thread across sockets so that a thread seeking the lock can find the lock on the same socket.
  - Reduces the time spent on acquiring locks and shared data access in the critical section.

POSITION OF RESPONSIBLITY

- Founder and CTO of **edAR labs** (IITM startup) (2017-2019)
  - edAR is an AR-based learning platform for school students that focuses on experiential learning.
  - Responsible for managing the development of the product and overseeing fundraising.