Akash Mishra | https://akash.codes

Indian Institute of Technology Madras

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Education

Program	Institution	%/CGPA	Year
M.Tech. (Computer Science and Engg.)	Indian Institute of Technology Madras	07.85	2021
B.E. (Computer Science Engineering)	Indore Institute of Science Technology	06.21	2018

Work Experience

R&D Intern: Samsung Research Institute, Bangalore **May 2020 - July 2020**

Open Information Extraction *Mentor: Harshavardhana, Team: On-Device AI*

- Worked as a part of the On-Device AI engineering team to develop an Open Information Extraction engine using unsupervised learning methods.
- Proposed, implemented and tested Deep Learning Models, Rule Based Models, and Machine Learning Models based off on the current SOTA papers.

Projects

Shortest Path Computations on Large Scale Road Networks **M.Tech. Project, IIT Madras**

Guide: Prof. John Augustine *Jan 2020 - Ongoing*

- Working as part of the Distributed Computing group at IIT Madras to develop distributed algorithms to enable more efficient shortest path computations on Large Scale Road Network Graphs.
- Working on Contraction Hierarchies on Dynamic Road Networks and how it can be optimised using a distributed computing approach.
- Working on crafting more sophisticated algorithms to accommodate needs such as ride-sharing, checkpoints based route-planning, etc.

Distributed Algorithms **Jan 2020 - Ongoing**

Distributed Computing Group

- A repository of Distributed Algorithms implemented using OpenMPI. The algorithms are referenced from various research papers, and books like Distributed Graph Algorithms, Distributed Network Algorithms.
- The repository includes Leader Election Algorithms in a cluster, Distributed BFS, Distributed QuickSort, Distributed K-Means, Distributed Shortest Path algorothms with more algorithms to be added.

Tripchip - Shortest Train Routes and Train Booking **B.E. Project, IIST, Indore**

Guide: Prof. Anil Khandekar *Sept 2017 - May 2018*

- Engineered a web application to make railway bookings easier. Provided an interface for multiple route rail bookings at once.
- Coded an algorithm (called HoneyBee) to find efficient chain routes between any two stations, if any direct trains are not available.
- Coded a web-scrapper to scrap important railways data, to be used by the HoneyBee algorithm.

Othello Playing Bot using Alpha Beta Pruning **IIT Madras**

CS6380: Artificial Intelligence, Prof. Deepak Khemani *November 2019*

- Created a bot for playing Othello on the Desdemona framework.
- Implemented Minimax algorithm with Alpha-Beta pruning. Also implemented an evaluation function by based off on a research paper from University of Washington, and improved it's heuristics.

Ham or Spam (E-mail Classifier) **IIT Madras**

CS5691: Pattern Recognition and Machine Learning, Prof. Arun Rajkumar *November 2019*

- Created an E-mail spam classifier as the final assignment.
- Implemented various Machine Learning algorithms from scratch as part of the course work.

Dimensionality Reduction Image Compression **IIT Madras**
CS6015: Linear Algebra & Random Processes, Prof. LA Prashanth *October 2019*

- Implemented Principal Component Analysis to reduce the dimensionality of the given dataset.
- Performed Singular Value Decomposition on the given image and reconstructed it using the top K eigenvectors, hence compressing the image in the process.

Load Balancing and Auto-Scaling on AWS **IIT Madras**
CS6847: Cloud Computing, Prof. D. Janakiram *Feb 2020*

- Implemented a server program to run on AWS servers. The server responded to different types queries - Respond with a random joke, respond with a random cat image, and fetch JSON data from an API service.
- Created AWS instances group with Load Balancing and Auto-Scaling enabled to check how the response times of a large number of requests change wrt number of running instances.

Live tweets analysis using Zookeeper, Kafka and Spark Streaming **IIT Madras**
CS6847: Cloud Computing, Prof. D. Janakiram *April 2020*

- Implemented cluster running Kafka, Zookeeper and Spark.
- Coded a program to use Twitter API to fetch live tweets for different topics and store them in their respective Kafka queues. Coded a spark streaming program to take data from Kafka queue, apply FP Growth algorithm and place results in a different kafka queue.
- Coded a server and a client program to display live FP growth results on a web interface.

Technical Skills

- **Programming Languages**: C/C++, Python, JavaScript
- **Markup/Styling Languages**: HTML, LaTeX, CSS
- **Frameworks and Libraries**: OpenMPI, Django, Tensorflow, Keras, scikit-learn, Node.js
- **Databases**: MySQL, MongoDB

Course Work (at IIT Madras

- **Algorithms**: CS5800: Advanced Data Structures and Algorithms, CS6170: Randomized Algorithms, CS6720: Data Mining.
- **Intelligent Systems**: CS5691: Pattern Recognition and Machine Learning, CS6380: Artificial Intelligence.
- **Systems & Programming**: CS6847: Cloud Computing, CS6140: Advanced Programming Lab
- **Mathematics**: CS6015: Linear Algebra and Random Processes.

Awards & Achievements

- Secured All India Rank 145 among 1 lakh candidates in GATE 2019.
- Won 1st prize in a 24 hours hackathon organized by Indore Institute of Science & Technology.
- Ranked under top 20 among 6000+ teams in IndiaHacks 2016 organised by HackerEarth, and was sponsored a trip for the onsite round.

Positions of Responsibility

- **Teaching Assistant**: TA for CS3300-Compiler Design, CS6013-Modern Compilers and CS6150-Advanced Programming Lab at IIT Madras
- **Co-Founder**: Programming club at IIST, Indore