Akash Mittal

akashmittal1798@gmail.com | +82-10-4039-0117|

SUMMARY

- Experienced in building end-to-end systems and services - Concept, Prototyping, and Deployment.
- **Research Interests & Skills:** Big Data, XAI, Recommender Systems, Social Network Analysis, and Mobile Sensing.
- Passionate about solving problems in the area of Healthcare/Wellness, Education, and Accessibility through technology.

EDUCATION

Indian Institute of Technology, Delhi 2015-2019

Bachelor of Technology in Computer Science and Engineering, GPA: 9.2/10.0

Thesis: GCOMB: Learning Budget-constrained Combinatorial Algorithms over Billion-sized Graphs. ***paper***

- Proposed a novel deep reinforcement learning based algorithm to solve combinatorial problems over large graphs
- GCOMB is 100 times faster and marginally better in quality than SOTA learning based combinatorial algorithms.
- Work was published in **Neural Information Processing Systems 2020** (A* conference in Machine Learning)

WORK EXPERIENCE

SAMSUNG RESEARCH HQ | Research Engineer — South Korea

Deploy Team — Jan 2021 – Present

- Built an on-device deep learning based infrastructure-free indoor positioning system using IMU sensors and WiFi.
- Achieved <5 meters of performance and >95% accuracy in identifying sections in real retail store.
- Piloted a location driven AR based application with 200+ users in one of the biggest retail stores in Korea.

Data Intelligence Team — Sep 2019 – Dec 2020

- **XAI:** Devised a sampling based approach for model interpretability measures and achieved 10X speedup.
- **Healthcare Informatics:** Modeled the user behavior using time series representation learning and built an intent prediction model using Samsung Health Data (400 TB).
- **Recommender Systems:** Placed in top-10 teams in a contest of music recommendation for a playlist.

INTERNSHIPS

NATIONAL UNIVERSITY OF SINGAPORE | Prof. Andrew Lim — Singapore | Summer 2019

Optimization of OD Engine

- Built an end to end service for the computation of OD matrix for any locations over complete Singapore map.
- Achieved 20X speedup over geo-informatics service by ArcGIS, using novel heuristics and deployed it in production.

SAMSUNG RESEARCH HQ | Data Intelligence Team — South Korea | Summer 2018

Continuous Machine Learning Flow

- Developed a continuous learning ML data pipeline using Apache NiFi & Sparkling Water to avoid model drift.
- Built a service data pipeline that is capable of making predictions on incoming data in real time.
- Got a full-time offer because of exemplary performance during internship.

PURDUE UNIVERSITY | Prof. He Wang — USA | Summer 2017

Automatic Gym Exercise Counting System

- Independently led the project and developed a POC for gym exercise counting system using surveillance cameras.
- Collected training data and built a deep learning model for gym exercise differentiation i.e. squats, pushup, etc.
- Extended the system from single person to multiple people present in gym and optimized it for speed.

PROJECTS

BRANULAR - AN INTERACTIVE BRAIN STUDY TOOL | Prof. Subodh Kumar — Dec 2016 - Jan 2017

- Created a 3D model of brain from segmented MRI scans and developed a windows application in Unity 3D to study the human brain in an interactive way.
- Designed and built a brain surgery simulator to help surgeons simulate the surgery experience.

INNAV - INDOOR NAVIGATION SYSTEM | Prof. M. Balakrishnan May 2016 - July 2016

- Designed and created an indoor navigation application for visually impaired people using audio based directions.
- Successfully deployed the system in one of the university buildings.
- Awarded **Design Innovation Award** by the Ministry of Human Resource Development (Government of India).

COURSE PROJECTS

Information Retrieval System | Prof. Srikanta Bedathur Aug 2018 - Oct 2018

- Implemented Boolean and Vector retrieval model to retrieve the ranked list of relevant documents for search query.
- Parsed Boolean queries (& and |) and implemented zone weighted ranking model.

Hand Drawn Sketch Recognition | Prof. Parag Singla Mar 2018 - Apr 2018

- Implemented a 7-layer CNN with residual links along with feature engineering of input image.
- Improved the performance using an ensemble of K-Means, SVM, Neural Networks and CNNs.

Medical Diagnosis | Prof. Mausam Feb 2018 - Mar 2018

- Modeled a Bayesian Network for a given data of health records with missing values.
- Implemented Expectation Maximization for learning the conditional probabilities in the Bayesian network.

Pipelined MIPS Processor | Prof. Kolin Paul Feb 2017 - Mar 2017

- Developed a multi-threaded pipelined MIPS processor in C that supported 30+ instructions.
- Created an animation engine for visualizing the different stages of instructions being executed by the processor.

AWARDS AND ACHIEVEMENTS

- Won 2nd place in **Samsung Foldable App Hackathon** for designing an innovative note taking application 2020
- **IITD Semester Merit Award** for being in top-5 students in the department in 7th Semester. 2018
- Among the 10 students selected for **Go-Boiler Research Internship Program** at Purdue University, USA. 2017
- **IITD Semester Merit Award** for being in top-7% of all students for two consecutive semesters 2015-2016
- Secured **All India Rank – 81** in JEE-ADVANCED among 1.3 million students. 2015
- Secured **All India Rank – 36** in National Level Science Talent Search Examination. 2015

TEACHING EXPERIENCE

UNDERGRADUATE TEACHING ASSISTANT | Prof. Anshul Kumar Aug 2018 - May 2019

Digital Logic and System Design, Computer Architecture

- Responsible for handling the lab work i.e. assistance in lab assignments and evaluation of 20+ students.
- Assisted in the execution of lab assignments and the correction of exam and quiz copies of 100 students.

RELEVANT COURSEWORK

- ML/AI/Data Science: Introduction to Artificial Intelligence, Introduction to Machine Learning, Machine Learning for Large Scale DB Systems, Information Retrieval, Data Mining, Introduction to Knowledge Graphs
- Theory/Algorithms/Systems: Digital Logic and System Design, Computer Architecture, Programming Languages, Operating Systems, Parallel Computing, Networks, Design Practices, Data Structures and Algorithms, Discrete Mathematics, Analysis and Design of Algorithms, Theory of Computation

EXTRACURRICULAR ACTIVITIES

Overall Coordinator - AINA IIT Delhi (An Initiative for National Advancement) July 2017 - May 2018

- Led a team of 20+ student volunteers to conduct weekly activities of social and national importance.
- Conducted weekly teaching program for 70+ underprivileged kids to inculcate ethical education and academics.
- Organized several India-wide immersive trips to understand social development models.

Xerox Research and GoodEd Technologies May 2016 – July 2016

Created study content including video lectures, quizzes, notes, and question bank for high school students.

Captain - Hostel Team of Table Tennis July 2016 - Apr 2017