Akash Mittal

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- I am interested in machine learning, data systems for ML, computer vision, mobile computing, and backend development.
- I have built and shipped several large-scale software/ML systems serving thousands of users over the past 4 years.
- I have authored multiple first-author patents and a publication at a top-tier ML conference like NeurIPS.

EDUCATION

University of Illinois, Urbana-Champaign (UIUC)
Masters in Computer Science
Aug 2022 – May 2024 | GPA: 4.0/4.0

Indian Institute of Technology (IIT), Delhi
B.Tech in Computer Science
Aug 2015 – May 2019 | GPA: 9.2/10.0

- IITD Semester Merit Award for 3 semesters for academic excellence.
- AIR 81 in Jee Advanced'15.

SKILLS

Programming Languages/Frameworks:
• Python (OpenCV, PyTorch, Keras)
• C/C++ • Kotlin • GoLang
• Flutter • React • Django • GraphQL

Others
• Android/Web Development (backend)
• CI/CD • AWS • git • docker • SQL
• Big data management (Spark)

COURSEWORK

ML/AI/Data Science
Artificial Intelligence
Machine Learning
Information Retrieval
Data Mining
Autonomous Vehicle Engineering
Deep Learning for CV

Systems/Theory
Distributed Systems
Advanced Data Management*
ML for Large Scale DB Systems
Operating Systems
Parallel Computing

TEACHING

- Machine Learning + Data Systems
- Algorithms for IoT and Data Science
- Computer Architecture
- Digital Logic and System Design

SIDE PROJECTS

- Decision support system for GOI
— python-django, react, graphql
- Music Table (Drums)
- Gym exercise counting system
— computer vision, embedded systems

INDUSTRY EXPERIENCE

Samsung - Think Tank Team | ML Intern — Ca, USA | May '23 - Aug '23

Worked on Samsung's future products related to robotics, computer vision, and AI assistant for smartphones. Filed 2 US Patents as a lead inventor.

Samsung Research | ML Engineer — Seoul, South Korea

Deploy Team - Location based intelligent services — Jan '21 - Jun '22

Tech: android-kotlin, TensorFlow lite, data collection for ML models

- Built and commercialized an on-device deep learning based indoor localization system being used by thousands of users.
- Architected the Android application, backend integration, CI/CD.

Data Intelligence Team — Sep '19 - Dec '20

Tech: AWS, sparkQL, data cleaning & preprocessing, python-django, graphQL

- Developed novel scalable explainable AI algorithms for AutoML platform.
- Derived insights from hundreds of terabytes of Samsung Health log data.
- Developed collaborative filtering-based music recommendation system.

Awards at Samsung

- S/W Development Award for improving the code review culture of the team. Awarded to top-10 developers annually in Samsung Research.

SELECTED RESEARCH PROJECTS

AIDB: a Sparsely Materialized Database for Queries using ML

Tech: Databases (postgresql, sqlite), vector search, unstructured data

- Proposed and developed a novel approach to analyze unstructured data (videos, images, and text) by mapping ML models to structured tables.
- Achieved 2-350× SQL query speedups on sparsely materialized tables.
- This work is *under review* in VLDB 2024 and open-sourced.

LensTalk-Personal AI assistants for physical world

Tech: object tracking, IMU-based motion tracking, android, python-backend

- Developed the camera and motion sensors-based privacy-preserving mobile device identification & localization technology. Filed a US Patent.

GCOMB: Learning combinatorial algorithms over large graphs

- Proposed a novel deep reinforcement learning based algorithm to solve combinatorial problems over billion-sized graphs.
- GCOMB is 100 times faster and marginally better in quality than SOTA.
- This work is published in NeurIPS 2020.

PUBLICATIONS AND PATENTS (Citations = 125+)

1. A. MITTAL et al. AIDB: a Sparsely Materialized Database for Queries using Machine Learning. **VLDB, 2024
2. S. Manchanda, A. MITTAL et al. GCOMB: Learning Budget-constrained Combinatorial Algorithms over Billion-sized Graphs NeuRIPS, 2020
3. A. MITTAL et al. Robotic ergonomic monitor arm for better posture. 2023
4. A. MITTAL et al. Automatic feature calibration for depth estimation. 2023
5. A. MITTAL et al. Identification and localization of mobile devices. 2023
6. A. MITTAL, et al. Device for building a map of indoor space. 2022