Karan Grover

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Experience

- **Meta (Facebook)** — New York
  Software Engineering Intern — *May 2022 - August 2022*
  - **AI Infrastructure**: Worked in the AI Infrastructure team to build a common inference service across Meta. Reduced the model onboarding time from a few days to a couple of hours by automating the onboarding pipeline.
  - **A/B Testing**: Developed the backend for the A/B Testing Framework for Facebook's Inference Service using Python & C++. Worked with ML Engineers and Product Managers to take the project from design to production.

- **Microsoft** — Bangalore, IN
  Software Engineer — *Jan 2018 - June 2021*
  - **Azure Confidential Computing**: Developed a cloud-native secure and scalable ML solution using Intel SGX and Torch in collaboration with Azure. Introduced new techniques to measure and improve the performance and latency of the deployed models while keeping the parameters and input secure.
  - **Azure Blockchain Service**: Worked on building backend for Blockene, a high throughput blockchain protocol running on mobile devices in collaboration with Azure. Built tools to identify bottlenecks and implement solutions to address them. Automated the deployment of the testbed on Azure consisting of thousands of VMs.
  - **Fullstack Development**: Developed a Project Management System for India's largest Non-Profit Organization - Child Fund India. Developed APIs and services allowing the organization to keep track of projects and funds.

- **Singapore Management University** — Singapore
  Research Assistant — *Jun 2016 - Dec 2016*
  - **Lifestyle Analytics**: Developed a system to identify item interactions of customers in a retail store via machine learning using sensor data from smartwatches, smartphones and BLE beacons. Presented our work in ISWC '18.
  - **Side Channel Attack**: Built a keystroke inference framework using the inertial sensor data obtained from a smartwatch. Presented our work in WristSense Workshop '17.

- **Backpack Labs** — New Delhi, IN
  Full Stack Developer — *May 2014 - Mar 2015*
  - **Ruby on Rails**: Backpack is a Learning Management System built for instructors. Lead the development of two product features from conception to production release. Implemented web caching to speed up the website.
  - **Android**: Developed the Android App supporting all the features of the website. Enabled offline support using SQLite databases. Integrated Google Analytics and supported greater than 500 daily sessions.

PUBLICATIONS

- Sambhav Satija, Apurv Mehra, Sudheesh Singanamalla, **Karan Grover**, Muthian Sivathanu, Nishanth Chandran, Divya Gupta, Satya Lokam. Blockene: A High-throughput Blockchain Over Mobile Devices. In OSDI 2020: USENIX Symposium on Operating Systems Design and Implementation.
- **Karan Grover**, Shruti Tople, Shweta Shinde, Ranjita Bhagwan, Ramachandran Ramjee. Privado: Practical and Secure DNN Inference. CoRR abs/1810.00602
- Sougata Sen, Archan Misra, Vigneshwaran Subbaraju, **Karan Grover**, Meera Radhakrishnan, Rajesh Krishna Balan, Youngki Lee. I4S: capturing shopper's in-store interactions. In ISWC 2018: Proceedings of ACM International Symposium on Wearable Computer.
- Sougata Sen, **Karan Grover**, Vigneshwaran Subbaraju, Archan Misra. Inferring smartphone keypress via smartwatch inertial sensing. In WristSense 2017: IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops).
- **Karan Grover**, Vinayak Naik. Monitoring of Android devices using SNMP. In COMSNETS 2016: 8th International Conference on Communication Systems and Networks.

PROJECTS

- **Fault Tolerant Collective Communication**: Pytorch uses Gloo library for collective communication during distributed training. Right now if the communication fails, the whole process comes to a halt. We modified the Pytorch and Gloo library to make this process fault tolerant.
- **Cloud Native LevelDB**: LevelDB is a key-value store based on LSM Trees. In this project we made it cloud native leveraging Amazon S3 as the backend. We developed a naive implementation and then tuned it to be 3x faster using Distributed Systems concepts.
- **Disaggregated Memory**: In this project, we demonstrated the promise of Disaggregated Memory for certain applications. We implemented a B+ Tree - underlying data structure in a database - on disaggregated memory connected by RDMA over Infiniband.
- **Cracking MD5 Hash using NVidia GPU**: In this project, I implemented a MD5 Hash cracking system on NVidia GPUs using CUDA. I compared and contrasted different ways of splitting the problem over multiple threads and blocks to find the pre-image of the hash value.

POSITIONS OF RESPONSIBILITY

- **Teaching Assistant, University of Wisconsin-Madison**: Helped design the assignments, grade projects and held office hours for the Data Structures and Algorithms course at the University of Wisconsin-Madison for two years.
- **Mentor, Rails Girls Summer of Code**: Mentored a team of 2 students in their Open Source contribution to OpenLMIS project for a period of three months.
- **Representative, Student Council**: Started a weekly mentorship program in my university where senior students can volunteer to mentor junior students in their academics.
- **Speaker, Open Source Developer Conference**: Conducted a two hour workshop for students in Delhi on the basics and internals of Git. Helped around 150 students collaborate on their first project through Github.

Education

- **University of Wisconsin-Madison** — Madison, Wisconsin
  MS in Computer Science — *Aug 2021 – Present*
  - **Courses**: Advanced Systems for ML, Distributed Systems, Introduction to AI, Big Data Systems, Topics in Databases, High Performance Computing, Intro to Information Security, Programming Languages and Compilers
- **Indraprastha Institute of Information Technology** — Delhi, India
  Bachelor of Technology in Computer Science — *Aug 2013 – Dec 2017*
  - **Courses**: Software Defined Networking, Security Engineering, Network Security, Wireless Networks, Analysis and Design of Algorithms, Operating Systems, Fundamentals of Databases

Certifications

- **Docker & Kubernetes, The Complete Guide - Udemy**: Learned production workflows of deploying Docker apps with Kubernetes. Built CI/CD pipelines from scratch with Github, Travis CI, and AWS. View certificate here.
- **Infrastructure as Code with Terraform - Google**: Learned how to build, change, provision, and destroy infrastructure using Terraform via the Google Cloud console. View certificate here.

Skills

- **Languages**: C++, Python, Java, Javascript, Bash
- **Technologies**: git, linux, REST, API, Relational Database, noSQL, HTML, Azure, AWS, Pytorch, Tensorflow, CUDA, Apache Spark, Hadoop, GRPC, Flask, Ruby on Rails, Docker, Kubernetes