SIDDHARTH LAL

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EDUCATION

- **Master's - Computer Science**, **University of Illinois Urbana-Champaign** Aug 2023 - Dec 2024
  GPA: 4.0/4.0; Relevant courses: Advanced Distributed Systems, Data Management, Secure Computation (Cryptography)
- **Bachelor's - Electrical Engineering (Minor: CS)**, **Indian Institute of Technology, Kanpur** July 2014 - Jun 2018
  GPA: 9.3/10.0; Relevant courses: Computer Organization, Database Management Systems, Data Structure and Algorithms

WORK EXPERIENCE

Software Engineer Intern, Motorola Solutions May 2024 - July 2024
Fullstack, Angular, Flask, PostgreSQL, Agile *Champaign, IL*

- Designed APIs to automate interoperability requests across Radio groups on the **Motorola Critical Connect Portal**, reducing onboarding time by **4x**, and developed a **relational data model** to streamline request management.

Senior Software Developer, Sears Transformco Sept 2022 - May 2023
Blockchain, web3 *Remote*

- Led the implementation of an Event Ticketing Web Marketplace, wrote optimised smart contracts in **Solidity**, and deployed them on the **Polygon TestNet**, reducing deployment cost by around **50x**.
- Used NodeJS-**web3js** for the Back-End and **NextJS** for the Front-End of the marketplace.

Senior Software Engineer, Samsung Research Mar 2020 - Mar 2022
Distributed Systems, Distributed Storage, Multicast, Kubernetes *Bangalore, India*

- Led the development of a mobile-based **Distributed File System** as part of Samsung's lightweight blockchain framework, leveraging sharding techniques and ensuring high availability through data replication, resulting in improved scalability
- Implemented content discovery and routing using **Distributed Hash Tables** (DHTs) and optimized **peer-to-peer** (P2P) networking on Android devices, enhancing Transactions per Second (TPS) and boosting **fault tolerance** to 30%.
- Deployed a **Kubernetes** cluster on **AWS Fargate** for containerized system simulations and integrated analysis using the **ELK** stack. Achieved **10 ms download latency** and **1-2 sec of upload latency** of a 1 MB file on a 120 node cluster.

Software Engineer, Samsung Research Jun 2018 - Feb 2020
Distributed Systems, Blockchain, Hyperledger, web3 *Bangalore, India*

- Developed a platform aimed at making **data sharing** between data warehouses and service provider partners transparent and traceable via the **Hyperledger Fabric** blockchain, worked in collaboration with **SRHQ Korea** and **SRC Canada**.
- Wrote the smart contract for this platform on Hyperledger in **Go** to implement the data sharing logic, and the middleware APIs in **NodeJs**. The platform enhanced secured sharing by **50%** of device data in **Samsung SmartThings** IoT setup.

COURSE PROJECTS

Advanced Distributed Systems: NVM Journaling — *C, Journaling, Non Volatile Memory, Caching*

- A **distributed key-value store** written in C, where each node has a **non-volatile memory** allocated to store a journal, which acts as both a cache and a traditional journal.
- Our experiments achieved upto **1.5x improvements** in read heavy workload throughput and **4x increase** in write heavy workload throughput for NVM Journaling compared to base case of direct journaling to disk.

Distributed Systems: MapleJuice — *Go, gRPC, Gossip , Distributed Storage* (Link to Project Repo)

- A **Distributed Task Scheduler**, similar architecture as in Hadoop to achieve distributed computing, with a custom-designed simple **distributed file system** (SDFS) and a **gossip-based membership protocol** (via UDP) built from scratch.
- MapleJuice can schedule and run custom Map and Reduce executable files, as well as **SQL commands** over data stored on SDFS with fault tolerance, achieving **6-7 seconds** of latency on a 10-node network for a task on 1 GB SDFS data.

TECHINICAL SKILLS

Programming Languages	Go, Python, Java, Kotlin, Solidity, C, C++, NodeJS, JavaScript, TypeScript, SQL, Angular
Software & Utilities	Linux, Android, AWS, Redis, Elasticsearch, Docker, Kubernetes, p2plib, Hardhat

PUBLICATIONS

- Criticality Aware Orderer for Heterogeneous Transactions in Blockchain *Published: May 2020*
  2020 IEEE International Conference for Blockchain and Cryptocurrency (ICBC) (link to the paper)