

# SAKSHAM DHULL

Software Engineer, Samsung Research, South Korea

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## WORK EXPERIENCE

**Samsung Research, South Korea** | *Software Engineer, Language & Voice Team* Jun, 2023 - Jan, 2024

- Led a team of 3 in developing a multi-modal Speech LLM in Python and JS, eliminating 2 redundant layers.
- Created a video summarization microservice using oneShot-TTS and Llama in React, with expression and emphasis cues.

**Samsung Research, South Korea** | *Software Engineer, 6G Research Team* Sep, 2021 - Jun, 2023

- Led a team of 3 to create an in-house memory profiler with a React frontend in Rust as an alternative to Valgrind.
- Engaged in developing a user space SCTP framework to boost the stack performance by 2.9%.
- Integrated a Machine Learning pipeline in the vRAN SCTP using Kubeflow, leading to a 3.7% increase in throughput.
- Collaborated within a team of 12 to build the L2/L3 protocol stack on an L1SE and test with 5 cell UEs and 1 BS using srsRAN.
- Established 6G stack spec on 3GPP 5G NR spec to reach the theoretical bandwidth limits of 30+ Gbps.

**Spotnana, Palo Alto, CA** | *Software Engineer, Backend Team* Jun, 2021 - Aug, 2021

- Developed a 1-click master service to automate REST API generation using OpenAPI specification.
- Leveraged the generated APIs to deploy a robust CI/CD pipeline, increasing the production speed by 6%
- Dramatically enhanced the development efficiency, resulting in streamlined operations for the team of 35+ members.

**Samsung Research, South Korea** | *Software Engineer Intern, 5G Research Team* May, 2020 - Jul, 2020

- Investigated the sub-optimal performance of kernel SCTP in multi-core systems for 5G networks.
- Built an in-house throughput profiling tool in GO and performed a technical benchmarking analysis of 3 frameworks.

## EDUCATION

- **Indian Institute of Technology, Delhi** - *Bachelor of Technology, Computer Science and Engineering*

## SCHOLASTIC ACHIEVEMENTS

- Recipient of the IIT Delhi Semester Merit Award, recognizing the top 7% of the cohort.
- Joint Entrance Examination (JEE) Advanced, 2017: secured **All India Rank 66** among 1.6M students.
- International Olympiads, 2017: Selected among the top 30 students from India for IPhO, IChO, and IOAA OCSC.

## TECHNICAL SKILLS

**Programming Languages:** C/C++, Python, Java, Rust, GO, SQL, Javascript, OCaml, UML

**Frameworks & Tools:** Kubernetes, Docker, Kubeflow, AWS, GCP, OpenAI, React, nodeJS, OpenCV, PyTorch, Tensorflow

**Specializations:** LLMs, REST APIs, Machine Learning, Software Design, Web3, System Software

## PROJECTS

**Fairness in Computer Vision** | *Prof. Chetan Arora, IBM Research* Sep, 2020 - Feb, 2021

- Engineered a Causality based VAE model to extract dependencies from a schematic model with 100+ features.

**PageRank using MapReduce** Mar, 2020

- Customized an MPI-based MapReduce library for PageRank, resulting in a 9% performance enhancement over MKL.

**Robust Hand Gesture Recognition** Nov, 2019

- Architected a 4-layer CNN model incorporating color segmentation and contour line detection to process images effectively.

**AI Bot for Cannon board game** Nov, 2019

- Created an AI bot utilizing 10 depth-bound adversarial searches with alpha-beta pruning to increase efficiency by 25%.
- Secured 3rd position in intra-branch knock-out tournament out of 43 teams.

**Multi-threaded CLI Chat Platform** Oct, 2019

- Coded a CLI messaging app, emulating the TCP protocol using sockets across 16 threads in Java.
- Designed an encrypted mode and a secure mode using the RSA algorithm and digital signatures.

**Incremental Breadth First Search** | *Prof. Sandeep Sen, Summer Research Fellowship, IAS* May, 2019 - Aug, 2019

- Invented a theoretical technique with novel bounds for maintaining the BFS tree of a graph in incremental scenarios.

**Into the Darkness, a Unity-3D game** May, 2019

- Generated an arcade game in C# & Unity Engine to sensitize people with difficulties faced by the visually impaired with real-life-like movements and 3D surround sound effects.

**Road Traffic Simulator** Mar, 2019

- Engineered a versatile graphical simulator using C++ and OpenGL to replicate emergent traffic behavior with 1M+ vehicles.
- Created a functional UI using OpenGL to emulate traffic signals in 2D and 3D environments.

**Multi Cycle ARM Processor with Interrupts** Mar, 2019 - May, 2019

- Coded a multi-cycle 32-bit ARM Processor with pipelining to handle instructions, interrupts, memory access, and I/O devices.

**Call-by-Value & Call-by-Name Interpreters** Feb, 2019 - May, 2019

- Implemented a Krivine Machine for Call-by-Name semantics and an SECD Machine for Call-by-Value semantics in OCaml.

**Distributed Cloud Computing on LAN** | *Prof. Subhashis Banerjee, DISA* May, 2018 - Oct, 2018

- Led a team of 3 to generate a distributed cloud computing framework on LAN using KVM, libvirt, and Python.
- Demonstrated a working Proof-of-Concept on 150+ CPUs in the Computer Lab, lowering the energy consumption by 14%.