Saksham Mishra

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Education

Indian Institute of Technology Bombay — **Bombay, India**
B.Tech. Computer Science Engineering — *Aug. 2024 – June 2028*

Achievements

Competitive Programming: Codeforces Peak Rating 1980 (Top 3% Globally), Goldman Sachs India Hackathon 2026 Rank 1388 / 16280 (Top 8.5%), MLH HackTU 6.0 Winner

Technical Projects

Distributed HPC Job Scheduler — Go, Raft Consensus, WebGL

- Implemented **Raft consensus algorithm** for distributed state machine replication across 100+ simulated nodes handling leader election, log replication, and snapshotting.
- Built fault-tolerant scheduler with automatic failover and crash recovery; achieved leader re-election under 150ms.
- Developed real-time 3D cluster visualization (Three.js/WebGL) showing node health, task distribution, and Raft term changes.

Particle Collision Monte Carlo Simulator — C++, Python, NumPy

- Achieved **670,000+ events/second** using vectorized numerics, cache-aligned data structures, and loop unrolling.
- Modeled relativistic 4-momentum scattering and implemented Kolmogorov-Smirnov tests for distribution fitting with residuals below 10^{-12} GeV.
- Profiled with perf and Valgrind; reduced branch mispredictions by 23% through lookup-table optimization.

Reliable Code Execution Sandbox — Go, Docker, gRPC

- Designed sandboxed execution pipeline with centralized state persistence, failure isolation, and retry orchestration using exponential backoff.
- Implemented retrieval-augmented validation reducing invalid generation rate by 37% across 10k+ internal test samples.
- Added Prometheus metrics for throughput, p50/p99 latency, and error-rate monitoring with Grafana dashboards.

Transformer Core from Scratch — Python, PyTorch, CUDA

- Implemented multi-head attention, positional encodings, and feed-forward networks without high-level transformer APIs.
- Optimized attention computation and memory layout achieving 2.3x throughput improvement over baseline implementation.
- Reduced KV-cache memory footprint by 41% using quantized storage techniques.

3D Skeletal ASL Recognition (Edge) — C++, TensorFlow Lite, MediaPipe

- Built real-time inference pipeline combining 3D skeletal coordinates with Bi-LSTM modeling achieving **99.86%** benchmark accuracy.
- Optimized deployment for Raspberry Pi 4B using quantization and graph pruning sustaining 30+ FPS with sub-50ms latency.

Experience

Fold Inc. — **Remote**
Software Engineering Intern (Systems) — *Jan. 2026 – Present*

- Building distributed code execution infrastructure handling **5k+ concurrent requests** with fault-tolerant state management, crash recovery, and workload orchestration.
- Implementing sandboxed runtime isolation using Docker and gVisor with fault-tolerant orchestration pipelines.

Intelligent Digital Twin (UK-India Collaboration) — **Remote**
Technical Lead — *Aug. 2025 – Present*

- Engineered multi-agent reinforcement learning simulation infrastructure for supply-chain optimization using Python and Ray.
- Optimized simulation throughput from 200 to 3.2k steps/sec via vectorized environment batching and shared-memory coordination.
- Research accepted at ISDSI-Global 2025; led transition from research prototype to deployable microservices.

UbiSys Lab, IIT Jodhpur — **Jodhpur, India**
Research Intern — *May 2025 – Aug. 2025*

- Engineered high-frequency telemetry collection system for edge devices sampling IMU streams at 200Hz with sub-5ms jitter.
- Built self-supervised representation-learning pipeline optimized for ARM-based edge deployment.
- Validated deployment pipeline for AAAI conference use-case handling 10k+ telemetry sessions.

Technical Skills & Leadership

Languages: C++, Go, Python, SQL

Systems & Infrastructure: Raft consensus, gRPC, Docker, Kubernetes, Prometheus, Linux, concurrency, distributed coordination

Numerical & HPC: Monte Carlo methods, vectorized computation, numerical linear algebra, CUDA

Software Engineering: Distributed Systems, Fault Tolerance, Concurrency, System Design, Performance Optimization, Observability

AlgoQuant Club (AQC) — Founder & Lead — *Sep. 2025 – Present*

- Conducted workshops on option pricing, Monte Carlo methods, probability foundations, and quantitative modeling.
- Built event-driven Python backtesting infrastructure supporting 10+ years of historical market data.

Technical Coordinator — Microsoft Student Learn Chapter (15k+ user events)