Mohammed Ishaaq

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Summary

Information Science & Engineering student (7th Semester) specialising in Artificial Intelligence, Machine Learning, and Full-Stack Development. Focused on how intelligent behaviour emerges from learning algorithms, with particular interest in reinforcement learning, curiosity-driven learning, and agentic AI systems. Experienced building patented hardware systems, full-stack web applications, real-time IoT platforms, and cross-platform mobile apps — with demonstrated real-world impact including a Government of India Design Patent and 1,00,000+ in incubation funding.

Technical Skills

Languages	Python, TypeScript, JavaScript, C++, HTML/CSS.
Frontend	React, React Native (Expo), Next.js, Three.js, Vite, Framer Motion, Tailwind CSS.
Backend	Node.js, Express.js, MongoDB, WebSockets, JWT Authentication, RESTful APIs.
ML / Deep Learning	PyTorch, TensorFlow/Keras, TF Lite, ONNX Runtime, ResNet/MobileNetV2, Curriculum Learning, Stochastic Pruning.
IoT & Edge AI	Raspberry Pi 5, Arduino Uno (AVR/C++), Sensor Integration, Edge Model Deployment.
Tools	Git/GitHub, Google Colab, VS Code, NumPy, Pandas, Matplotlib, Chart.js, Supabase.

Education

B.E. Information Science and Engineering — 7th Semester — 2023 – Present
BGS College of Engineering and Technology, Bengaluru (VTU) — CGPA: 8.06

PUC — Science Stream
Falcon PU College — 84%

KSEEB Class 10
St Joseph's Indian High School — 74%

Projects

Staged Embarrassment Learning (SEL) — v1 v2 Live

- Engineered SEL, a novel curriculum-driven, sparsity-aware training framework — the model tracks a per-class *embarrassment signal* (temperature-scaled cross-entropy) and directs compute only toward classes it is genuinely failing on.
- Achieved **82.2% accuracy on CIFAR-10** with **99.1% FLOPs reduction** (33.5T → 0.34T) and **42% less training time** (1480s → 859s) on an NVIDIA T4 GPU against a dense ResNet-18 baseline.
- Implemented 5-Stage Curriculum Learning with dynamic sparsity masking: ∼97% of gradients zeroed per update at steady state via a decaying percentile threshold.
- Built a Real-Time Telemetry Dashboard (HTML/JS) visualising per-class embarrassment signals, FLOPs divergence, and accuracy curves.

Recylo — AI Waste Segregation System (SIH 2025, Patent No. 482604-001) — Repo Live

- Patented AI-powered waste segregation ecosystem (Design No. 482604-001, filed Dec 2025) built during **120 hours** at SIH 2025, GIET Gunupur; collected India-specific on-site training data for real-world robustness.
- Trained a MobileNetV2/ResNet CNN exported to ONNX for **edge inference on Raspberry Pi 5**, classifying waste into 10 sub-classes mapped to 4 physical bins at **90% accuracy**.
- Developed a full **React + Vite + TypeScript** app (three portals: Citizen gamification, Truck Driver routing, Municipal analytics) backed by Supabase.

IWM Reverse Vending Machine (RVM) Repo Live

- Built an automated PET bottle collector on **Arduino Uno (AVR C++)**: 3-stage pipeline (ultrasonic detection → inductive material check → HX711 load cell weight validation, 15g–35g) with conveyor transport and thermal coupon printing.
- Stored all string literals in Flash via **PROGMEM** to avoid SRAM exhaustion on 2KB ATmega328P RAM; calibration factor persisted across reboots via EEPROM.
- Build cost ~15,000; **JVTM Prize winner** and **1,00,000+ incubation funding** from BGSCET Innovation Cell.

OceanOS — Marine Conservation Platform Repo Live

- Built a full-stack real-time marine platform: **Node.js + Express** REST API, **WebSocket** feed (5s live IoT broadcast), **sql.js** (WebAssembly SQLite) for zero-dependency local storage, and **Gemini 2.5 Flash** for AI debris detection and a conversational marine assistant.
- Developed 8 modules: unified Three.js 3D simulation (ocean boom, drone patrols, river nets, oil spills), Chart.js admin dashboard, FisherGuard fisherman credit app, and 4 standalone Vite/TypeScript simulations.
- Engineered illegal fishing tracker with MPA zone violation detection and real-time WebSocket-driven vessel monitoring.

FitQuest — Fitness Marketplace Repo Live

- Built a dual-sided **MERN stack** marketplace connecting verified coaches and gyms with users (Sports, Exercise, Dance, Yoga); JWT + Bcrypt auth, role-based routing, review system, and real-time booking with Framer Motion UI.

OnlyFriends — Social Accountability Platform (2nd Place, ZeroOne Hackathon 2026) Repo Live

- Built in **48 hours**: cross-platform mobile accountability app (React Native + Expo Router) with private goal communities, Duolingo-style streaks, real-time leaderboards, achievement badges, and push notifications.
- State managed via TanStack Query and Zustand; single codebase targets iOS, Android, and Web through Expo.

Innovation & Achievements

Design Patent — Government of India	Patent No. 482604-001, granted for an intelligent waste segregation device.
Grand Finalist — Smart India Hackathon 2025	Selected among top national teams; presented at GIET Gunupur, Odisha.
1,00,000+ Incubation Funding	Awarded by BGSCET Innovation Cell for AI waste segregation and recycling systems.
Winner — Jnana Vijnana Tantrajnana Mela	National-level engineering innovation exhibition.
2nd Place — ZeroOne Hackathon 2026	Built OnlyFriends in 48 hours.

Problem Solving

Solved **30+ Data Structures & Algorithms** problems on LeetCode using Python, covering arrays, strings, recursion, and dynamic programming.

Research Interests

Artificial Intelligence · Deep Learning · Reinforcement Learning · Curiosity-Driven Learning · Agentic AI Systems · Edge Computing · Compute-Efficient Training