JOSHUA JACOB THOMAS

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AI/ML-focused CSE undergraduate at National Institute of Technology, Calicut with strong foundations in artificial intelligence, machine learning paradigms, competitive programming, and scalable system design. Experienced in building ML-driven applications and full-stack systems. Open-source enthusiast interested in algorithms, modern ML, and reliable intelligent systems.

Technical Skills

Languages: Python, C/C++, JavaScript, TypeScript, SQL, Bash
AI/ML: PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, Seaborn, MediaPipe, OpenCV
Frontend: React, Next.js, HTML5, CSS3, TailwindCSS
Backend: Node.js, Express.js, Flask, FastAPI
Databases: MySQL, Qdrant (Vector DB)
Tools: Git, GitHub, Docker, Linux, LaTeX
Concepts: Machine Learning Paradigms, Transformers, Mechanistic Interpretability, Data Structures & Algorithms, Scalable System Design, RESTful Architectures, OOP, CI/CD Pipelines, Full-Stack Engineering, Cyber Security

Professional Skills

- Leadership | Public Speaking | Technical Communication | Team Collaboration | Analytical Thinking

Education

National Institute of Technology Calicut — Kozhikode, India
B.Tech in Computer Science and Engineering — ***CGPA: 9.82 / 10*** — *2025 – 2029*

- Placement Representative, Centre for Career Development (2025 – Present)
- Member, CP Hub NITC (2026 – Present)
- Member, Cyber Security Club NITC – AI Exploitation Specialization (2026 – Present)
- Member, FOSSCell NITC (2026 – Present)
- AI/ML & Marketing Member, Google Developer Student Clubs NITC (2025 – Present)
- Member, IEEE Student Branch NITC (2025 – Present)
- Member, DebSoc NITC (2025 – Present)

CBSE Class XII — India
AISSCE — ***AIR 1*** *– 499/500* — *2025*

- Subject Topper AISSCE: Computer Science, Mathematics, Chemistry, English — 2025
- KEAM Rank 1 — 2025
- JEE Main – 99.749 Percentile — 2025
- JEE Advanced – AIR 2475 — 2025
- Head Boy, Sarvodaya Central Vidyalaya — 2024 – 2025
- Magazine Editor — 2024 – 2025
- Yellow House Captain — 2023 – 2024

CBSE Class X — India
AISSE — ***AIR 2*** *– 499/500 (Best 5)* — *2023*

- Master Prefect — 2022 – 2023
- Club Ambassador, Nature Club — 2021 – 2022

Experience

Web Developer Intern | *TEDx NIT Calicut* Feb 2026 – Mar 2026

- Engineered animated speaker card components in React/TypeScript using modified Chroma Grid architecture with GSAP-driven motion, 3D tilt, flip-to-bio transitions, spotlight masking, and custom glow effects.
- Built reusable modal system featuring backdrop blur transitions, direction-aware carousel animations, navigation controls, and refined micro-interactions.
- Contributed to dynamic countdown section using React + Framer Motion with responsive time calculations, animated counters, glassmorphism UI, and particle-based animated backdrop.

Public Relations & Content Executive | *Tathva NIT Calicut* Sep 2025 – Nov 2025

- Conducted structured student outreach via calls and WhatsApp messaging to increase event registrations and workshop participation.
- Drafted clear, neutral communication for event updates and conflict resolution across student groups.
- Coordinated with internal teams to ensure accurate information dissemination and smooth participant onboarding.

Projects

InboxZero – Gmail Extension | *Manifest V3, JavaScript, Gemini 2.5 Flash Lite* 2026

- Built AI-powered Gmail extension performing deterministic 3-bullet summarization and strict single-label categorization directly via DOM parsing and UI injection.
- Implemented hybrid spam engine combining Gemini inference with modular weighted heuristics (0–100 score) using domain, URL, phishing, and pattern analysis.
- Designed Manifest V3 architecture with background service worker, content-script messaging, and modular Gmail parser + UI injection pipeline.
- Developed fully client-side secure key handling (chrome.storage.sync), adjustable spam sensitivity, and enforced prompt-output constraints for consistent inference.

MediTrack – AI Medical Timeline System | *Flask, Qdrant, FastEmbed, Groq Llama 3.3, ReportLab* 2026

- Built secure medical timeline platform with voice-to-note capture (Web Speech API), document upload, multi-hospital patient IDs, and authenticated access (Flask-Login + bcrypt).
- Integrated Qdrant (384-dim embeddings, cosine similarity) for semantic retrieval across longitudinal clinical events.
- Implemented AI-driven timeline analysis using Groq-hosted Llama 3.3 70B with semantic shift scoring and record-quality metrics.
- Designed PDF export pipeline (ReportLab) and secure read-only share links for doctor-ready medical reports.

GeneScope | *FastAPI, React, Ingenious Mathematical Risk Scoring System* 2026

- Developed web-based genetic risk assessment platform predicting 10 inherited diseases via weighted clinical scoring.
- Designed transparent risk model combining Family (40%), Lifestyle (35%), and Lab Values (25%) with Class I–IV stratification.
- Built personalized prevention engine generating screening plans, urgency levels, and consultation guidance.
- Implemented full-stack architecture (FastAPI backend + React/Vite frontend) with explainable outputs and rule auditability.

Grid-X – Distributed Compute Mesh | *FastAPI, WebSockets, Docker, TypeScript SDK* 2026

- Designed coordinator–worker distributed architecture for isolated Python job execution across LAN nodes.
- Built FastAPI scheduler with HTTP + WebSocket endpoints for real-time job streaming and worker state tracking.
- Implemented Docker-backed worker agents with resource monitoring and task lifecycle management.
- Developed modular TypeScript SDK for job submission, worker registration, and credit-based execution logic.

Inference-Time LLM Steering via Activation Directions | *PyTorch, Transformers* 2026

- Implemented contrastive activation steering without weight updates to control LLM uncertainty behavior at inference time.
- Computed normalized steering direction $v = \mu(h_{hedged}) - \mu(h_{direct})$ and injected layer-wise hidden-state interventions during generation.
- Conducted layer and alpha sweeps to evaluate controllable shifts in hedge frequency and response tone.
- Built automated evaluation pipeline measuring semantic similarity, keyword alignment, and uncertainty markers.

Interactive AI/ML Portfolio | *Python, JavaScript, HTML5 Canvas, PyTorch, Scikit-learn* 2026

- Built interactive ML portfolio demonstrating 6 models end-to-end: Logistic Regression, Linear Regression, Random Forest, MNIST digit classifier, MicroGrad autograd engine, and GPT-2 Transformer modules.
- Implemented from-scratch autograd engine (MicroGrad) with Value class, chain-rule backpropagation, and MLP training with no PyTorch or NumPy.
- Built canvas-based real-time visualizations: animated forward pass, computation graph with live gradients, attention flow, and XOR decision boundary evolution.
- Implemented full preprocessing pipeline for hand-drawn digit recognition: bounding box crop, 20×20 resize, 28×28 centering, and normalization with in-browser distribution shift analysis against MNIST training data.

HOLOrIG – Gesture-Based Holographic Interaction System | *Python, OpenCV, MediaPipe, NumPy* 2025

- Built real-time gesture-controlled interaction system using webcam-based hand landmark detection (MediaPipe).
- Implemented 3D gyroscopic rings and orbit-core demos with gesture-driven rotation, zoom, spin, and depth-based shading.
- Designed 2-link robotic arm with inverse kinematics enabling index-controlled motion and pinch-based gripper actuation.
- Developed state-driven interaction pipeline mapping 2D gesture space to real-time 3D transformations.

Zombie Orb Arena – Browser Survival Shooter | *JavaScript, HTML5 Canvas, WebAudio* 2025

- Built wave-based survival shooter with structured mini-boss (5,15,25...) and boss (10,20,30...) progression logic.
- Implemented advanced boss mechanics (laser sweeps, teleport slams, projectile storms, healing phases) with visual telegraph system.
- Designed delta-time game loop, real-time particle engine, and state-machine driven game architecture.
- Developed adaptive WebAudio engine with dynamic SFX cues (no external audio assets).

Wi-Fi Latency Monitoring System | *ESP8266, Embedded C* 2025

- Built microcontroller-based real-time Wi-Fi latency measurement system using packet timing diagnostics.
- Implemented memory-efficient buffering and serial reporting for network stability analysis.
- Designed lightweight embedded firmware for continuous network performance monitoring.