

PRANESH S

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PROFESSIONAL SUMMARY

Final-year B.Tech Computer Science and Engineering student specializing in Artificial Intelligence and Machine Learning, with professional and project experience across multi-agent AI systems, production AI automation, backend and full-stack engineering, native desktop and mobile applications, computer vision, natural language processing, cloud deployment, and applied machine learning. Built and deployed systems spanning a 17-subagent finance platform, an automated AI research agent, native developer tooling, multilingual neural machine translation, computer-vision exercise analysis, geospatial mobile applications, and ML-backed analytics. Co-author of two AI research papers and co-inventor of an Indian patent related to ML- and GPS-based fuel and driving analytics.

EDUCATION

SRM Institute of Science and Technology, Vadapalani Campus <i>B.Tech, Computer Science and Engineering – Artificial Intelligence and Machine Learning</i> • CGPA: 8.72/10	Chennai, India <i>Expected May 2027</i>
Velammal School <i>CBSE Class XII</i> • Percentage: 66%	Chennai, India <i>2023</i>
SBOA School and Junior College <i>CBSE Class X</i> • Percentage: 76%	Chennai, India <i>2021</i>

TECHNICAL SKILLS

Programming Languages: Python, Java, C, C#, SQL, JavaScript, TypeScript, Dart, Swift, Kotlin, HTML, CSS
AI / Machine Learning: Machine Learning, Generative AI, Large Language Model Applications, Small Language Models, Agentic AI, Multi-Agent Systems, Retrieval-Augmented Generation (RAG), Natural Language Processing (NLP), Neural Machine Translation, Multimodal AI, Computer Vision, Human Pose Estimation, Embeddings, Semantic Similarity, TF-IDF, BERT, Sentence Transformers, Gradient Boosting, Regression, Data Preprocessing, Feature Selection, Model Evaluation, Quantization, Edge AI, Efficient Inference, Prompt Engineering
AI / Research Frameworks and Models: LangGraph, LiteLLM, Pydantic, scikit-learn, Pandas, NumPy, IndicTrans2, Whisper, Meta MMS-TTS, EasyOCR, MediaPipe Pose Landmarker, OpenAI APIs, Anthropic Claude API, AWS Bedrock, Vector Databases
Backend / APIs / Data: FastAPI, REST APIs, API/SDK Integration, JWT Authentication, bcrypt, SQLAlchemy, Alembic, PostgreSQL, SQLite, Redis, MySQL, State Management, Idempotency, Approval Workflows, Structured Logging, Caching, Background Processing, Rate Limiting
Frontend / Web: React, Next.js, Vite, Tailwind CSS, Streamlit, HTML, CSS, Full-Stack Web Development, GitHub API
Mobile / Native / Desktop: Flutter, Android Development, Kotlin, Jetpack Compose, Room, WorkManager, Google Play Services, iOS Development, Swift, SwiftUI, AppKit, C#/.NET, WinForms, Native Desktop Development, System-Tray/Menu-Bar Utilities
Cloud / Deployment / DevOps: Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), Vertex AI, Railway, Vercel, Render, Netlify, Hugging Face Spaces, Docker, GitHub Actions, CI/CD, Cloud Deployment
Testing / Reliability / Security: pytest, Automated Testing, Unit Testing, Integration Testing, End-to-End Testing, API Testing, Security Testing, Regression Testing, Synthetic Evaluation, Stress Testing, Concurrency Testing, Process Isolation, Timeout/Retry Handling, Failure Recovery, Prompt-Injection Boundaries, SSRF/Safe-Fetch Controls, Secret Hygiene
Geospatial / Device / Accessibility: Google Maps, GPS, Geospatial Filtering, Spatial Caching, Device-Sensor Integration, Accessibility-Aware Development, Dynamic Type, VoiceOver Semantics, Reduce Motion
Research / Evaluation: Literature Review, Research Methodology, Experimental Design, Benchmarking, Comparative Analysis, Reproducible Evaluation, Cross-Validation, Error Analysis, Scientific Writing
Developer Tools: Git, GitHub, Xcode, Android Studio, Visual Studio, Claude Code, OpenAI Codex

PROFESSIONAL EXPERIENCE

Stratova AI <i>AI Innovation Engineer Intern – Enterprise AI / FinanceIQ (FINA)</i> • Engineered and validated 40 modular AI agents across enterprise AI workflows using LangGraph, LiteLLM, and Pydantic; completed 40/40 live Google Cloud validation tests. • Led end-to-end development and delivery of FinanceIQ (FINA), a 17-subagent finance automation system covering collections, accounts payable/receivable, invoice processing, reconciliation, financial reporting, budgeting, forecasting, spend compliance, and executive analytics. • Implemented runtime-configurable tool enablement, REST/API and ADK integrations, human approval workflows, idempotency and stop controls, state management, audit logging, RAG workflows, automated evaluation, and deployment preparation. • Designed PeopleIQ/CRIZ meeting-intelligence and knowledge workflows for transcription, speaker diarization, summarization, action-item extraction, vector retrieval, and RAG using FastAPI, Next.js, PostgreSQL, Redis, Claude API, AWS Bedrock, and vector databases.	Remote <i>Apr. 2026 – Jun. 2026</i>
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- Collaborated in a nine-member remote engineering team through Git-based reviews and delivered root-agent, subagent, API, integration, ADK, and security test coverage.

Gradtwin Services (OPC) Private Limited

India

Machine Learning Intern

Mar. 2026 – Jun. 2026

- Completed a Machine Learning domain internship focused on applied ML concepts and projects; prior project records associate the internship period with work including the Beats Per Minute (BPM) Predictor.

RESEARCH PAPERS

FitVision: Real-Time Exercise Form Tracking and Performance Analysis Using Computer Vision Under Review, 2026

- **Authors:** Pranesh S, Chandrika Banerjee, M. Ulagammai.
- Designed and evaluated a privacy-preserving browser-based exercise analysis system using MediaPipe Pose Landmarker, confidence filtering, exponential smoothing, aspect-ratio-corrected joint-angle computation, temporal state machines, and explainable rule-based scoring.
- Evaluated deterministic exercise logic across **38 synthetic cases**, correctly counting **49/49 expected repetitions** with **zero false positives and zero missed repetitions**.
- Maintained **589 passing automated tests** across engine/package, frontend UI, backend, contract, and browser end-to-end layers; separated synthetic evaluation from partial real-camera validation.
- Implemented browser-side inference with React, TypeScript, Vite, and MediaPipe; backend persistence uses FastAPI, Pydantic, SQLAlchemy, and SQLite. Raw camera video is not uploaded or stored.

IndicBridge: A Context-Aware Multimodal Neural Machine Translation Framework for Indian Regional Languages Using IndicTrans2 Under Review, 2026

- **Authors:** Chandrika Banerjee, Pranesh S, Shalini M, Dr. Theresa Cenate C F.
- Co-developed a multimodal translation framework supporting text, speech, image, and document workflows using IndicTrans2, Whisper, Meta MMS-TTS, and EasyOCR, with automatic source-language detection and direct Indic-to-Indic routing.
- Built a layered React/TypeScript and FastAPI architecture with shared model inference, caching, analytics, benchmarking, OCR, speech, and document processing.
- Investigated a third-party preprocessing/postprocessing reliability defect that could leak up to **69 blocked threads**; mitigated it using process isolation, bounded timeouts, worker replacement, and pipeline-level locking.
- Validated the architecture with **100/100 successful stress-test requests**, **zero failures**, **zero timeouts**, stable thread/process counts, **2.537 s average latency**, and **2.674 s p95 latency**.

ONGOING RESEARCH

How Far Can Useful Language Intelligence Be Pushed Down the Hardware Hierarchy?

2026 – Present

- Conducting independent research into useful language intelligence on resource-constrained edge hardware using small language models.
- Investigating task specialization, multi-small-model architectures, quantization, constrained-memory inference, format control, numerical consistency, and methods for improving useful task performance without relying on frontier-scale models.
- Designing controlled local experiments and reproducible evaluation workflows across model capability, response behavior, inference stability, and hardware/resource constraints, with intended targets spanning microcontrollers, Raspberry Pi-class hardware, and mobile devices.

StrideSense / StepLab – Smartphone Step-Counting Research

2026 – Present

- Ongoing research into smartphone-based step counting, sensor-derived activity measurement, algorithm reliability, and real-device validation.
- Conducted literature-review, literature-matrix, research-gap, and experiment-planning work; built the **StepLab v0.1** Android data-collection application to support structured experiments.
- Developed native Android step-tracking infrastructure using Kotlin/Jetpack Compose, Room persistence, Google Play Services step data, background/reconciliation logic, automated unit/instrumented testing, and diagnostics; broader research validation remains in progress.

TECHNICAL PROJECTS

AgentMeter – Local Codex and Claude Code Usage Monitor | C#, .NET, WinForms, Swift, SwiftUI, AppKit, JSON-RPC 2026 – Present

- Built a local-first desktop developer utility for monitoring Codex and Claude Code usage without an AgentMeter account, telemetry, prompt inspection, or credential extraction.
- Developed the Windows system-tray application and native macOS menu-bar/notch application, including provider discovery, structured usage retrieval, 30-second refresh, stale/unavailable states, timeout/cancellation, process cleanup, and contextual CLI/desktop activity detection.
- Integrated Codex through app-server JSON-RPC and Claude Code through structured, prompt-free usage queries; designed provider failures to remain isolated.
- Maintained **500+ automated Windows tests** plus separate macOS unit/component and live-provider validation covering parsing, subprocess lifecycle, activity classification, account safety, privacy boundaries, and UI state.

AI Radar – Automated AI Research and Briefing System | Python, Telegram, SQLite, Alembic, Pydantic, OpenAI APIs, Docker, Railway Sep. 2026 – Present

- Built and deployed an automated AI research pipeline that discovers, normalizes, clusters, filters, ranks, researches, verifies, and summarizes current AI developments.
- Produces an analyst-style private briefing and a public-facing draft, with Telegram-based human-in-the-loop **EDIT / GO / SKIP** workflows, exact-version approval safety, persistence, and audit history.
- Implemented source provenance, claim-verification states, semantic duplicate handling, persistent scheduling, SQLite migrations/backups, cost ledgers and spending guards, retry/failure handling, safe-fetch/SSRF protections, prompt-injection boundaries, secret redaction, and duplicate-run prevention.
- Runs as an always-on Railway service using Python 3.13, Docker, Telegram long polling, persistent SQLite, and timezone-aware scheduling; the project maintains **800+** **automated tests** across unit, integration, pipeline, approval, and adversarial-security behavior.

Refuel – Native Fuel Station Discovery Application | *SwiftUI, Kotlin, Jetpack Compose, Google Maps*, Sep. 2026 – Present
REST, Geospatial Data

- Designed and developed separate native iOS and Android applications for fuel-station discovery, with synchronized product semantics and cross-platform feature parity.
- Implemented map-first discovery, list/map switching, search, brand/fuel/product filters, station preview/detail flows, favourites, provenance display, list-only records, clustering, external navigation, caching, and deterministic result behavior.
- Built a data-quality/provenance model requiring authoritative or cross-validated evidence before production-map inclusion and designed the data layer to accept future licensed OMC/authorized feeds without client redesign.
- Implemented accessibility-aware behavior including light/dark appearance, Dynamic Type, VoiceOver semantics, and Reduce Motion; validated with native unit, presentation, instrumentation, API-contract, security/resource, and parity checks.

FitVision – Real-Time Exercise Form Tracking System | *React, TypeScript, MediaPipe, FastAPI, SQLAlchemy*, Jul. 2026
SQLite

- Built a browser-based real-time exercise analysis application using human pose estimation for camera setup, joint-angle analysis, movement-state detection, repetition counting, corrective feedback, scoring, and post-session analytics.
- Designed client-side pose inference so raw video remains on-device while structured numeric results are persisted through FastAPI; implemented reusable pose, exercise, and workout engines.
- Achieved **49/49 correctly counted synthetic repetitions** across 38 evaluation cases with zero false positives/misses and **589 passing automated tests**.

Fuel Tracker & Driving Behavior Analytics | *Flutter, Dart, Python, FastAPI, PostgreSQL, scikit-learn*, Feb. 2026 – Apr. 2026
Google Maps

- Built and deployed a Flutter Android application, FastAPI backend, PostgreSQL data layer, and Gradient Boosting model for fuel-consumption prediction and driving-behavior analytics; deployed the API on Render.
- Trained a Gradient Boosting Regressor with 200 estimators and max depth 8 on approximately **1,600 trip samples across 10 features**, achieving $R^2 = 0.94$, $MAE = 0.32$ L, and **cross-validated $R^2 = 0.91$** .
- Engineered JWT-secured live GPS endpoints with bcrypt authentication, route storage/visualization, Google Maps polylines, `fl_chart` analytics, and an in-app database covering **87 Indian vehicle profiles**.
- Implemented driving-behavior scoring for harsh acceleration, overspeeding, idling, and erratic speed variation.

AI Resume Screening & ATS Analysis System | *Python, FastAPI, Next.js, NLP, TF-IDF, BERT, Sen*, Jan. 2026 – Feb. 2026
tence Transformers

- Built and deployed a full-stack AI resume analyzer at resumeanalyzer.org using FastAPI and Next.js.
- Engineered a 100-point ATS scoring system combining TF-IDF cosine similarity with BERT/Sentence Transformer semantic matching.
- Implemented PDF/DOCX parsing, keyword extraction, formatting analysis, impact-verb detection, radar-chart visualization, and actionable recommendations; scoring included Keyword Match (35%), ATS Format (20%), Impact Score (15%), plus Skills, Structure, and Grammar components.

Beats Per Minute (BPM) Predictor | *Python, scikit-learn, Regression, Hugging Face Spaces* Jul. 2025 – Nov. 2025

- Developed a regression-based machine-learning system to predict BPM from structured inputs, including preprocessing, feature selection, model training, evaluation, and visualization.

- Deployed real-time inference on Hugging Face Spaces with an interactive input and result-visualization interface.

Personal Portfolio Website | *React, JavaScript, GitHub API, Vercel* Live

- Designed and developed pranesh.me, a responsive portfolio showcasing projects, skills, and achievements.
- Integrated the GitHub API for live repository statistics, built modular reusable React components, and deployed on Vercel with a custom domain.

PATENT & INTELLECTUAL PROPERTY

AI-Powered Fuel Tracking and Driving Behavior Analysis System 2026

- **Granted Indian Patent** – Co-Inventor, Indian Patent Office. Application No. **202641044392**; originally filed Apr. 2026.
- Covers an ML- and GPS-based system combining fuel-consumption prediction, trip analytics, and driver-behavior assessment.

CERTIFICATIONS

AWS Certified AI Practitioner (AIF-C01) – Amazon Web Services Apr. 2026 – Apr. 2029

- Credential ID: **956ca5d100e342a8a3a596aedf8c3820**

Microsoft Certified: Azure Fundamentals (AZ-900) – Microsoft Jul. 2026

- Credential ID: **B5870094785EF892**

GitHub Foundations – GitHub Jul. 2026 – Jul. 2028

- Credential ID: **A4318F00017A77C3**

Programming in Java (Elite) – NPTEL, IIT Kharagpur Jan. 2026 – Apr. 2026

Introduction to Machine Learning – Elite – NPTEL, IIT Kharagpur Jul. 2025 – Sep. 2025

Design Thinking: A Primer – Elite – NPTEL, IIT Madras Jul. 2024 – Aug. 2024

LEADERSHIP & COMMUNITY INVOLVEMENT

Ayaan Foundation	Chennai, India
<i>Volunteer – Community Development</i>	<i>May 2025 – Jul. 2025</i>
Supported tree-plantation and beach-cleaning initiatives and collaborated with a four-member team on sustainability and environmental-awareness activities.	
BMAD & 2nd Chance Animal Shelter	Chennai, India
<i>Volunteer – Animal Welfare</i>	<i>Apr. 2024 – Jul. 2024</i>
Assisted with shelter operations, animal care, food distribution, and resource management for rescued and sheltered animals.	

LANGUAGES

Tamil: Native Proficiency	English: Professional Working Proficiency	Hindi: Limited Working Proficiency	French: Limited Working Proficiency
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