Abyud Somashekara Shetty

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Profile

Computer Science student fascinated by how AI can turn a difficult problem into something useful. I enjoy learning how models work, building the software around them, and testing where their answers hold up. My work spans machine learning, AI tools and sensor systems, and I am keen to keep learning with a team that builds for real needs.

Education

Bachelor of Technology in Computer Science 2023 - 2027

PES University

- **Coursework:** Machine Learning, Data Structures and Algorithms, Software Engineering, Database Systems, Image Processing, Object-Oriented Programming, Cloud Computing, Digital Twins, Operating Systems, Computer Networks, Compiler Design, Augmented and Virtual Reality

Experience

Summer Intern Jun 2026 - Jul 2026

Centre for Augmented and Virtual Environments (CAVE) Lab, PES University

- Developed and debugged a real-time motion-capture system using 10 MPU6050 IMUs across distributed ESP32 nodes, processing quaternion orientation data and integrating calibration and inverse kinematics for full-body motion reconstruction.
- Integrated the end-to-end sensor pipeline across ESP-NOW, UDP, WebSocket, and HTTP, connecting embedded sensor nodes to the SlimeVR server and Three.js visualization layer for real-time skeletal tracking.
- Containerized the backend and visualization stack with Docker Compose and implemented recording, calibration, and debugging workflows to support reproducible motion-capture experiments and system validation.

Projects

AnchorMatch - Multilingual Business Entity Resolution Sep 2026

- Co-built a pipeline matching noisy business records across the US, India and France; fine-tuned a multilingual transformer bi-encoder with hard negatives and built dense retrieval, normalization and Indic-script transliteration.
- Built a two-stage LightGBM matcher using fuzzy, IDF and edit-pattern features, plus a decoder enforcing one entity per record; my stage achieved 0.9889 holdout F0.5 and 0.9826 leaderboard on the team pipeline.
- Kept evaluation entities unseen by the encoder and built full-candidate-graph context features to address training/serving skew; separated encoder-training, matcher-training and holdout folds.

Quorum - Coordination Layer for AI Coding Agents Oct 2026 - Present

- Built a TypeScript platform connecting Claude Code and Codex across folders and machines; wrote the JSON Schema and OpenAPI contract, Fastify and SQLite server, message-delivery hooks and idle wake.
- Built controls from 34 security invariants: hash-chained logs, secret scanning and wake limits; implemented a relay with TLS terminating at the home server's pinned key, keeping forwarded messages unreadable to the relay.
- Wrote crash tests checking committed events survive a killed writer; the repository includes over 500 tests.

TyreTrace - Bayesian Tyre-Degradation Research Oct 2026 - Present

- Built a Python research workbench on an 84-weekend F1 data lake; implemented hierarchical Bayesian models with NumPyro/JAX, mixed-effects estimation and gradient-boosted baselines to study confounded tyre, fuel and track effects.
- Implemented rolling backtests, Student-t uncertainty calibration, synthetic recovery tests and an information-gain run planner; built a React dashboard for inspecting predictions, coverage, model comparisons and failed experiments.

Buy or Wait? - Affordability Forecast Agent Sep 2026

- Built a Python pipeline using Claude for structured extraction from 215 messages and 16 scanned images; deterministic code evaluates payment plans for 250 requests against 90-day forecasts, protected expenses and eligibility rules.
- Validated extracted facts against sources and replayed plans before output; 103 PyTest tests cover financial rules and prompt injection, while cached evidence supports reruns without model calls; final run cost $2.68 across 40 calls.

KiranaAI - Multilingual Retail Automation Jun 2026

- Co-built a retail platform with multilingual WhatsApp order intake, credit tracking and forecasting; implemented synthetic-data generation and feature engineering, and co-developed XGBoost sales regression and stockout classification.
- Generated 180 days of data for 20 store clusters and 25 products; engineered calendar, festival, lag and rolling features, shifting sales before rolling calculations and using a 150-day/30-day chronological train/test split.

Technical Skills

Languages: Python, SQL, TypeScript, JavaScript, Java, C++, Kotlin
AI/ML: PyTorch, Hugging Face Transformers, scikit-learn, XGBoost, LightGBM, JAX, NumPyro, LLM APIs
Data & Analysis: NumPy, Pandas, SciPy, Polars, OpenCV, ArviZ
Backend & Data: FastAPI, Django REST Framework, Node.js, Fastify, Spring Boot, PostgreSQL, MySQL, SQLite, MongoDB
Frontend & 3D: React, Next.js, TypeScript, Tailwind CSS, Three.js, React Three Fiber, Drei
Testing & DevOps: PyTest, unittest, Vitest, JUnit 5, Git, GitHub, GitLab, CI/CD, Docker, Linux
APIs & Agent Tools: REST APIs, OpenAPI, JSON Schema, WebSockets, MCP, Claude Code, Codex
Certifications: Introduction to Large Language Models, Deep Learning - IIT Ropar