

KSHITIJ G SHETTIGAR

Bangalore, India | gskshitij0638@gmail.com | +91 91487 70308
[kishi836.github.io](https://github.com/Kishi836) | github.com/Kishi836 | linkedin.com/in/kshitijgshettigar

SUMMARY

Pursuing a Bachelor of Technology (B.Tech.) in Computer Science and Engineering at PES University — successfully completed the second year, expected to graduate in 2028 — with a minor in Medical Innovations and Technology, currently an IoT & Robotics intern at Tripple One Solutions. Builds systems software end to end — a process-migration virtual machine in Rust, a zero-knowledge password manager, an AI-assisted security scanner, and healthcare-interoperability tooling (FHIR/HL7) — with a strong foundation in low-level systems, Linux, embedded hardware, networks, and applied machine learning.

EDUCATION

PES University, Bangalore	Sep 2024 – May 2028
B.Tech in Computer Science & Engineering · Minor in Medical Innovations and Technology	
- Minor coursework: Anatomy/Physiology/Pathology, Algorithms in Medicine, Medical Imaging (DICOM/NIfTI, SimpleITK), and Medical Informatics (HL7, ICD-10/SNOMED, EHR pipelines). - Technical electives: Augmented & Virtual Reality (OpenGL/C++, Unity, Three.js/WebXR, Blender — CAVE Labs) and ROS for Autonomous Systems (ROS 2 Humble, Gazebo, Nav2, SLAM — MARS Lab). - Seniors-taught courses (peer electives taught by specialized senior students): Slot 19 (Sem 1) — Arduino & Microcontrollers; Slot 20 (Sem 3) — Music Production.	
Pre-University Course, Kamataka Board	Aug 2022 – Feb 2024
Edify School, Bangalore (CBSE)	2012 – Jun 2022

EXPERIENCE

Tripple One Solutions Pvt. Ltd. — IoT & Robotics Intern Bangalore, Hybrid	Jun 2026 – Present
- Develop STEM robotics and IoT kits together with the accompanying training content used to teach embedded systems and automation. - Build internal prototypes and R&D proof-of-concepts: sensor and development-board evaluation, and embedded firmware for Arduino and ESP32 microcontrollers (sensor integration, actuator and motor control). - Implement device-to-cloud connectivity for prototypes over MQTT/HTTP telemetry.	

PROJECTS

Parakaya — Live Process-Migration Virtual Machine Rust	2026 – Present
- Designing and building a snapshot-native WebAssembly interpreter in Rust (edition 2024, <code>#![forbid(unsafe_code)]</code>), zero runtime dependencies) whose entire execution state — value stack, call frames, program counter, linear memory, globals, and tables — is plain serializable data, so a running program can be checkpointed at any instruction boundary. - Architected a cross-device live-migration system that moves a mid-execution program across heterogeneous hardware (x86-64 PC, aarch64 Raspberry Pi, Android phone, cloud VM) via a two-phase, WAL-backed, epoch-fenced handoff protocol enforcing two invariants: the program never runs on two devices at once and is never lost, even across power loss at any step. - Verifying with an industrial deterministic-simulation strategy: the W3C WASM spec test suite in CI, differential fuzzing against wasmtime, cross-ISA bit-identical resume checks, and 1,000+ randomized power-loss injections; executed milestone-by-milestone under TDD with CI enforcing rustfmt and clippy -D warnings. Milestone 1 (VM core) in progress.	
PassGen Vault — Zero-Knowledge Password Manager JavaScript, Flutter/Kotlin, Web Crypto, Microsoft Graph API	2026
- Shipped a cross-platform manager — a single-file web app, an iPad web client, and a native Flutter/Kotlin Android app — sharing one AES-256-GCM-encrypted vault synced through OneDrive; all cryptography runs client-side with no third-party crypto libraries, so the cloud only ever stores ciphertext. - Hardened key handling with PBKDF2-SHA256 at 600,000 iterations and hardware-backed biometric unlock: an Android Keystore RSA-2048 key gated by BiometricPrompt (auto-invalidated if enrolled fingerprints change) and WebAuthn PRF Secure-Enclave Face ID on iPad. - Integrated direct OneDrive sync via the Microsoft Graph API with device-code OAuth (refresh-token session — the app never sees the Microsoft password); built a 32-char generator on <code>crypto.getRandomValues</code> with rejection sampling to eliminate modulo bias, and shipped in-app self-test suites (65/66 checks).	
Clinical Timeline Builder — FHIR R4 Interoperability Python, HAPI FHIR, REST APIs	2026
Modelled a complete diabetic-care pathway as 20 hand-authored FHIR R4 resources across 10 resource types (Patient, Encounter, Observation, Condition, MedicationRequest, AllergyIntolerance, Provenance, and more), coded with LOINC, ICD-10, RxNorm, and UCUM.	

- Built Python tooling that validates and idempotently upserts resources to a live HAPI FHIR server via conditional updates (rewriting local references to server-assigned IDs), submits atomic transaction Bundles with urn:uuid resolution, and reconstructs a chronological, encounter-grouped patient timeline from FHIR search.
- Implemented Provenance audit trails and ABHA identifiers, and self-assessed against India's ABDM/NRCES FHIR R4 Implementation Guide.

RepoGuard — AI-Assisted Source-Code Vulnerability Scanner | *Flask, React 19, Groq LLaMA 3.3, Bandit/njsscan, OSV* 2026

- Built as part of a 6-person team in the CIE Ignite Phase 2 startup programme: a hybrid scanner that combines static analysis with an LLM reasoning layer to detect vulnerabilities in Python and JavaScript source before deployment.
- Implemented a Flask backend (/scan, /scan-repo, /health) running a multi-pass pipeline — Bandit (Python) and njsscan (JavaScript) for fast static analysis, a Groq Llama-3.3-70b-versatile pass to cut false positives and generate fix suggestions, and a live OSV.dev dependency check that maps CVSS scores to severity tiers.
- Added GitHub-repo scanning that shallow-clones a public repo, filters source files, and feeds them to the LLM for cross-file analysis; normalized findings to OWASP Top-10 categories in a React 19 + Vite dark-themed UI.

Meditech Lab 2.5 — Healthcare Informatics Dashboard | *Python, Flask, PostgreSQL, HL7 v2.5, Chart.js* 2026

- Built a modular Flask dashboard (~3,300 lines of Python, 26-commit history) simulating a hospital lab pipeline over a real PostgreSQL database, with a pure domain layer isolated from HTTP/DB wiring and a DB-free pytest suite.
- Wrote an HL7 v2.5 message builder from scratch (MSH/EVN/PID/PV1/DG1/OBX/ORC segments), emitting real ADT^A04 and ORU^R01 messages on patient registration and lab-result entry, animated through a six-stage NiFi→Postgres→Elasticsearch→Kibana→MinIO pipeline.
- Shipped five modules — patient registry, intake, clinical-note entity extractor, an ICD-10/SNOMED coder with hierarchy and cross-map, and a live pipeline view — for the Medical Informatics course (UE26MT324) of the Medical Innovations & Technology minor.

Heart-Disease Predictor — Staged Screening Model | *Python, XGBoost, SHAP, Flask, React* 2026

- Built a progressive 3-stage XGBoost screening model on the 918-record UCI Heart Failure dataset that asks the cheapest, most-informative tests first — 83.5% accuracy / 0.876 AUC at the 4-feature quick stage, escalating to 90.4% accuracy / 0.938 AUC at the full 11-feature stage.
- Made predictions clinically interpretable with per-patient SHAP explanations (ranked risk drivers), a what-if risk simulator that re-scores modified feature values toward optimal, rule-based treatment suggestions, and a heart-age estimate; served via a Flask API and a React/Vite frontend. Built at the Epoch Datathon.

Histopathology Classifier — Vision Transformer | *PyTorch, timm, ViT-B/16, Grad-CAM* 2026

- Trained a ViT-B/16 (ImageNet-pretrained, via timm) to detect metastatic tissue in 96×96 histopathology patches on the 262,144-image PatchCamelyon dataset, using PyTorch with AdamW, mixed-precision (AMP), and BCEWithLogitsLoss, benchmarked against an EfficientNetV2-S baseline.
- Evaluated with ROC/AUC, accuracy, and confusion matrices, and produced Grad-CAM heatmaps for interpretability.

SDN Traffic Classifier — Software-Defined Networking | *Mininet, POX, OpenFlow, Wireshark* 2026

- Built a traffic-classification system on Mininet with a custom POX OpenFlow controller that classifies TCP/UDP/ICMP packets on packet_in, installs protocol-specific match-action flow rules, and reports live per-protocol statistics every 10 seconds.
- Demonstrated the reactive-to-proactive flow benefit empirically — first-packet latency of ~93–98 ms (controller flow install) dropping to ~0.04 ms once rules match — validated with Wireshark captures and OpenFlow flow-table dumps.

Capstone Research — On-Device 3D Gaussian Splatting (early stage) | *Research / Edge ML* 2026 – Present

- Proposed the team's capstone problem statement — energy-truthful, on-device 3D Gaussian Splatting, driving pruning/compression from measured energy on real edge hardware; the project is in its early stages and actively being worked on.

Other Projects | *C, Python, Verilog, Arduino* 2024 – 2026

Smart Sensor Glove — wearable built with three friends — five onboard sensors mapped a room during a walkthrough, graphing temperature, humidity, and Wi-Fi signal strength to pinpoint the strongest-signal zones.

Swift Lexer & Parser — a lexer/parser for a subset of Swift in Python (PLY) with grammar rules and line/column error recovery.

News Aggregator — a C program using a custom max-heap priority queue to rank headlines from real newspaper CSV feeds.

I2C Protocol Simulation — a master/slave I2C bus in Python over TCP sockets (JSON frames, ACK handshake) and a Verilog I2C master/slave with testbench.

TECHNICAL SKILLS

Languages: Python, C, C++, Rust, Java, JavaScript

Systems & Hardware: Linux (Arch, KDE Plasma/Hyprland, dual-boot), Arduino, ESP32, Raspberry Pi, Embedded Systems, IoT

Web & Backend: React (Vite), Node.js, Express.js, Flask, REST APIs, HTML, CSS

ML & AI: XGBoost, PyTorch, timm / Vision Transformers, SHAP, LLM integration (Groq API, LLaMA 3.3)

Health Tech: FHIR R4, HAPI FHIR, HL7 v2.5, DICOM/NIfTI, SimpleITK, ICD-10 / SNOMED / LOINC

Security & Networks: AES-GCM / PBKDF2 (Web Crypto), Bandit, njsscan, OSV API, Mininet, POX/OpenFlow, Wireshark

Graphics & Robotics: OpenGL, Unity, Three.js / WebXR, Blender, ROS 2 (Gazebo, Nav2, SLAM)

Databases & APIs: PostgreSQL, MongoDB, SQLite, Microsoft Graph API

Tools: Git, GitHub, MATLAB, Simulink, LTSpice

ACHIEVEMENTS

- Represented India at the FIRST LEGO League International Open Championship, Sydney (2019) — qualified by placing 4th in India at the national championship, then finished 15th of 32 international teams in Australia.
- 1st Place — Best Project Award, FIRST LEGO League Regional (2019).
- 3rd Place — Aakriti Inter-School Design Competition (2020).
- Ranked 5th in school in the CBSE Class 10 board examinations.

CERTIFICATIONS & COURSES

Harvard ManageMentor — Leadership & Management (Harvard Business Publishing, 2024)

Robotics & electronics: STEM DROID — Robotics Levels 1–6 (Grade 5 through the FLL Internationals, 2019) · Arduino & Microcontrollers course (Grade 7) · PESU I/O: Automation with Arduino · SP Robotics: Robotics & IoT

Other: CAMPK12 Python Level 3 · CBSE & Intel India AI-Thon Workshop

INTERESTS & HOBBIES

- Medical innovation — keen interest in emerging healthcare technologies and medical devices that improve patient care and operational efficiency; pursued hands-on through the Medical Innovations & Technology minor and the FHIR/HL7 interoperability and clinical-ML projects above.
- Gaming & game development — a serious long-term interest and career direction; chose the Augmented & Virtual Reality technical elective (Unity, OpenGL/C++, WebXR) specifically to build toward game development.
- Hands-on electronics — Arduino and LEGO EV3 builds since middle school, including automatic sanitizer dispensers, an Arduino-based Chrome-dino handheld game, and a 3-finger EV3 exoskeleton glove.
- Keyboard & music production — took the Slot 20 seniors-taught Music Production course; also into Linux & OS customization (Arch daily driver), cycling, and the outdoors.