

Utkarsh Singh

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Software engineer who ships complete products end-to-end — iOS capture, GPU ML pipelines, search infrastructure, and the web apps on top.

EXPERIENCE

Jaguar Land Rover — Software Engineer

Jul 2022 – Oct 2025 · Bengaluru

- Co-developed, in a team of 3, an in-house vehicle-software testing product in three editions — headless (Flask), PySide6 desktop for Windows/Linux, and a touch-based reTerminal build — for PDU-signal and SOME/IP testing against in-vehicle ECUs; projected to save ~£500k in licensing costs, with usage telemetry recording 500+ unique machines.
- Owned the entire PDU pipeline: independently reverse-engineered the undocumented ~100k-line quarterly ARXML network specification and wrote the Python parser extracting all PDU-, ECU-, and signal-level structure (IP/port maps, MSB/LSB packing, OPAQUE lengths, periodic timing) that powered every edition; ported it to C++, cutting parse time from ~2–3 s to ~0.1 s.
- Built its user-facing tooling: ECU-pair selection, signal send/monitor over Ethernet, per-PDU periods, and functional-safety fault injection (error/stop) on counter and checksum signals; also owned the keyboard-free reTerminal edition for Apple CarPlay lab testing and the drag-and-drop GUI-creator that exports user-built dashboards as runnable Python.
- Built scheduled Jira → BigQuery ingestion pipelines (Python, Cloud Functions on GCP) powering 40+ Tableau dashboards that management self-served for periodic decisions; ranked #1 among all Tableau creators org-wide on the internal leaderboard.
- Automated supplier-Excel → Jira workflows with a PySide6 app that handled thousands-of-row files across per-project field rules and color-coded Jira/Excel discrepancies in the sheet itself, replacing line-by-line manual processing.

INDEPENDENT PROJECTS

roomstudio — spatial-intelligence product: iPhone LiDAR scan → AI-readable 3D room → conversational redesign · [live](#) · [GitHub](#)

Jan 2026 – present

- Solo-built ~93k LOC across three surfaces — SwiftUI/ARKit/RoomPlan capture app, GPU perception pipeline on Cloud Run L4 (SAM 3 segmentation, SAM 3D Gaussian-splat reconstruction, ~14k LOC of placement/fusion geometry), and a Next.js + three.js splat-rendering web app — with ~2,160 automated tests and 129 written decision records.
- Conversational redesign with Claude: a streaming tool-use “guest” whose furniture-move proposals carry no numbers by design — a server-side solver owns all geometry (318 solves measured across four captured rooms, 57 correctly refused, 3.9 ms each) — plus confidence-gated vision inference of per-wall materials.
- Measurement-driven throughout — the reference room’s 275.8 MB splat payload compresses 5.84× to SPZ (a room-independent ratio), cutting its load from 87–93 s to 14–19 s; privacy engineering including person suppression and EXIF-purged history.

gitsearch — semantic search over GitHub: find repos by what they do · [live](#) · [GitHub](#)

Apr 2026 – present

- Crawled ~267k repos and indexed ~244k with embeddings; three-lane hybrid retrieval (Postgres full-text, pgvector HNSW dense vectors, trigram name matching) fused by weighted Reciprocal Rank Fusion in a single 34-parameter SQL query — ~120 ms warm latency, ~\$30/month to run.
- Built a TREC-style evaluation harness: 9,492 LLM-judged relevance labels (UMBRELA), hand-implemented nDCG parity-tested against trec_eval, Fisher randomization significance testing, a frozen canary suite as a deploy gate, and a cross-family judge audit (Cohen’s $\kappa = 0.712$).
- Agentic per-repo usage guides (Claude tool loop over a sandboxed read-only repo view); LLM query-enrichment pipeline on Gemini/Anthropic batch APIs with cosine-gated acceptance.

Shrink to Fit — exact-size image & PDF compressor, fully client-side (canvas, Ghostscript-WASM DPI ladder, predictive quality search); no uploads, metadata stripped — built in a day · [live](#) · [GitHub](#)

Aug 2026

WhatsApp Archive Viewer — read-only chat-style viewer for WhatsApp export zips; salvages truncated archives that standard zip tools silently drop — built in a day · [live](#) · [GitHub](#)

Aug 2026

linework — generative-art gallery (Canvas/WebGL) where every piece exports plotter-ready SVG by replaying the drawing code into a recorder · [live](#) · [GitHub](#)

Jul – Aug 2026

EDUCATION

Indian Institute of Technology Delhi — B.Tech + M.Tech, Chemical Engineering · CGPA 8.6/10

Jul 2017 – May 2022

- M.Tech thesis: computational generation of packed-bed reactor geometries — rigid-body packing simulation (Blender/Bullet), analytic + image-based porosity analysis (MATLAB), conjugate-heat-transfer CFD (Ansys Fluent) · [GitHub](#)

SKILLS

Languages	Python, C++, Swift, TypeScript/JavaScript, SQL, C, MATLAB, GLSL
Systems & cloud	FastAPI, PostgreSQL + pgvector, GCP (Cloud Run incl. GPU, BigQuery, Cloud Functions, Eventarc, Cloud Tasks, Firestore, GCS), Firebase, Docker, GitHub Actions, Protocol Buffers
ML & AI	Embeddings & semantic retrieval (sentence-transformers, HNSW), LLM engineering (Anthropic & Gemini APIs — streaming, tool use, batch, prompt caching), IR evaluation (nDCG, qrels, significance tests), PyTorch, SAM-family vision models
Product & UI	SwiftUI/ARKit/RoomPlan, React/Next.js, three.js/WebGL, PySide6/Qt, Tableau, Selenium

HONORS & AWARDS

- Department Rank 1 — Chemical Engineering dual-degree batch · Semester Merit Award (twice) — IIT Delhi
- JEE Advanced: AIR 2525 (top 1.14%) · JEE Main: AIR 742 (top 0.06%) · Exceptional Creator Award, Jaguar Land Rover (2025)
- SOF Mathematics Olympiad — Zonal Rank 3 (finals) · Rank 3, inter-school maths exam, awarded by the Governor of U.P.