

YIFEI LIAN

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SUMMARY

AI software engineer with strong Python and TypeScript, building ML/LLM systems and full-stack products end-to-end. Shipped a real-time perception MVP at an early-stage startup and multiple GenAI-driven projects (React smart task tracker, enhanced SAC trainer) using Gemini 3, ChatGPT and Claude as core parts of the development workflow. Comfortable with embeddings, vector search and quickly turning ambiguous ideas into working, human-centric prototypes.

EDUCATION

Imperial College London — London, UK
MSc Human and Biological Robotics

Sep 2025 – Present

University College London (UCL) — London, UK
BEng Electronic and Electrical Engineering (First-Class Honours)

Sep 2022 – Jun 2025

WORK EXPERIENCE

Software Engineering Intern — Coach Cube AI, London, UK

Jul 2025 – Aug 2025

- Owned the MVP for a real-time perception service, designing a modular, model-agnostic pipeline and clean APIs that delivered an investor-ready demo in 8 weeks and allowed rapid swaps of camera/model setups.
- Implemented 2D detection and 3D triangulation/single-view lifting in Python (PyTorch/ONNX, OpenCV), with light smoothing filters and basic telemetry to track latency and accuracy for tuning.
- Productionised time-series ML infrastructure as containerised services with dataset versioning and CI/CD, so new models could be tested and rolled out through regression-safe experiments.
- Defined data schemas and logging for metrics, running small bake-off style comparisons to balance accuracy, frame rate and compute cost.
- Used Gemini, ChatGPT and Claude Code as coding partners for scaffolding utilities, tests and runbooks, cutting repetitive implementation and documentation work by around 15%.

PROJECTS

Enhanced Soft Actor-Critic (SAC) for BipedalWalker-v3 — Imperial College London

Nov 2025 – Present

- Evaluated ML/CV rendering approaches for robotics/AR (e.g., Gaussian Splatting vs. traditional pipelines) to support **data generation** and **simulation**.
- Built Python metrics (IoU, reprojection error) to assess fidelity and generalization; quantified trade-offs and found fidelity was limited by input data quality, not the renderer.

Smart Task Tracker — Imperial College London

Oct 2025 – Nov 2025

- Built a gamified Pomodoro + task-tracking SPA in React 18, TypeScript, Vite and Tailwind in ~4 weeks, with an interactive character, task board and lightweight analytics dashboard optimised for mobile.
- Co-designed components, state model and UX flows with Gemini 3 and Claude, and sketched a Node.js + PostgreSQL + vector store backend for future personalised recommendations based on embeddings.

3D Rendering Evaluation for Robot Perception — UCL Computer Science Dept

Oct 2023 – Oct 2024

- Evaluated ML/CV rendering approaches (e.g. Gaussian Splatting vs traditional pipelines) for robotics/AR simulation, scripting Python experiments to benchmark fidelity and runtime across scenes.
- Implemented IoU and reprojection-error metrics to compare renderers and showed that input data quality, more than renderer choice, was the main bottleneck for downstream perception performance.

TECHNICAL SKILLS

Languages: Python, TypeScript/JavaScript, C, SQL, MATLAB

AI & GenAI: PyTorch, OpenCV; Gemini 3, ChatGPT and Claude for coding, design and LLM orchestration; embeddings and vector search.

Full-stack & Infra: React, Vite, Tailwind, REST APIs, Node.js; Docker, Git, GitHub Actions, AWS/Azure, Linux.

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EDUCATION

Imperial College London — London, UK

Sep 2025 – Present

MSc Human and Biological Robotics (Predicted First-Class Honours)

Relevant Modules: Data Analysis for Research, Reinforcement Learning, Image Processing

University College London (UCL) — London, UK

Sep 2022 – Jun 2025

BEng Electronic and Electrical Engineering (First-Class Honours)

WORK EXPERIENCE

Software Engineering Intern — Coach Cube AI, London, UK

Jul 2025 – Aug 2025

- Established an image-annotation schema and labeling guidelines; built format converters and validators to normalize disparate annotation formats and enforce cross-pipeline consistency, cutting invalid annotations by 20% and raising data acceptance rate by 10%.
- Built Python ingestion/cleaning/normalization scripts (invalid labels, class imbalance, corrupt media) with deterministic, seeded train/val/test splits and dataset versioning; reduced time-to-ready training data by 8 hrs/week.
- Productionized the data-prep service as a containerized (Docker) REST API; added a live preview, CI/CD (GitHub Actions), and unit/integration tests—boosting pre-merge defect catch rate by 18% and cutting rollbacks by 25%.
- Instrumented data-quality checks (row/file counts, label/class distributions, missing/duplicate rates, schema-drift flags) in Python and shipped a lightweight KPI dashboard (Tableau/Excel) to monitor throughput and error rates; mean triage time/incident reduces by 12%.
- Partnered with engineering and product to operationalize data findings (revised labeling rules, filtering criteria, acceptance gates), improving downstream model stability and reducing re-run churn by 10%.

RESEARCH EXPERIENCE

UCL Computer Science Dept. — London, UK

Oct 2023 – Oct 2024

- Evaluated ML/CV rendering approaches for robotics/AR (e.g., Gaussian Splatting vs. traditional pipelines) to support data generation and simulation.
- Implemented Python data loaders and format adapters to handle heterogeneous datasets; optimized I/O and batching for large runs.
- Built an evaluation pipeline (clear metrics, repeatable runs) and conducted error analysis to identify data issues (mislabelled samples, distribution drift).
- Computed 95% confidence intervals for evaluation metrics across repeated runs to quantify variance and compare model versions.
- Collaborated on code reviews & version control; ensured reproducibility via pinned environments and seeded processes.

Hybrid Body Lab, Cornell University — Ithaca, NY, USA

Jun 2024 – Sep 2024

- Developed data capture utilities (BLE) and structured logs to support downstream analysis.
- Standardized timestamping/synchronization and sanity checks to improve traceability.

UCL Surgical Robot Vision Group — London, UK

Jun 2023 – Aug 2023

- Built structured logging and telemetry for device data to support off-line analysis; reduced drop-outs and improved trace completeness.
- Documented data collection procedures to ensure consistency across runs.

SKILLS

Programming: SQL (joins, window functions, CTEs, query tuning); Python (pandas, NumPy, scikit-learn, statsmodels); Excel (Pivot, Power Query)

Experimentation & Metrics: A/B test design & analysis (t-test/ χ^2 , CUPED), metric governance, guardrails, funnel/retention/CVR

BI & Viz: Tableau; matplotlib

Data Ops: Git/GitHub, CI/CD, Docker; dataset versioning, deterministic train/val/test splits

Quant/TS: GLMs; time-series (ARIMA/Kalman/GARCH); Bayesian (PyMC)

Languages: English (Fluent), Mandarin Chinese (Native)

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University College London (UCL) — London, UK

Sep 2022 – Jun 2025

BEng Electronic and Electrical Engineering (First-Class Honours)

WORK EXPERIENCE

Software Engineering Intern — Coach Cube AI, London, UK

Jul 2025 – Aug 2025

- Delivered an investor-ready real-time perception MVP in 8 weeks by architecting a modular, model-agnostic service with clean REST APIs and built-in telemetry.
- Dockerised** time-series ML and data-prep services and set up **CI/CD** (GitHub Actions) with deterministic train/val/test splits, dataset versioning and automated checks, reducing rollbacks by 25%.
- Standardised image-annotation schema, labelling guidelines and validation tools, cutting invalid annotations by 20% and increasing data acceptance rate by 10%.
- Instrumented monitoring and KPI dashboards (**throughput, error rates, class/label distributions, drift flags**) that cut mean incident-triage time by 12% and improved downstream model stability by 10%.
- Defined data schemas and telemetry for bake-off experiments to balance accuracy, frame rate and cost for demos, using **GenAI** assistants to speed up utilities, tests and documentation.

RESEARCH PROJECTS

Imperial Computer Science Dept. — London, UK

Oct 2025 – Present

- Implemented a Soft Actor-Critic agent in **PyTorch**/Gymnasium (adapting CleanRL), adding action-safety constraints and automatic entropy tuning for stable continuous control.
- Built **training diagnostics** (learning curves, phase portraits, loss-vs-torque plots) to detect instabilities and decide when a policy is safe enough to freeze / deploy.
- Assessed robustness, safety and energy use, proposing domain randomisation and a PID “safety cage” controller to guard against noise, latency and dangerous joint commands.

UCL Computer Science Dept. — London, UK

Oct 2023 – Oct 2024

- Benchmarked ML/CV rendering pipelines for robotics/AR, implementing Python data loaders and format adapters for large heterogeneous datasets.
- Built an evaluation pipeline with clear metrics, repeated runs and 95% confidence intervals; used error analysis to uncover mislabels and distribution drift.
- Ensured reproducible experiments through code reviews, version control, pinned environments and seeded runs.

UCL EEE Dept. — London, UK

Sep 2024 – Jun 2025

- Built an object-centric SLAM pipeline that treats detected objects as landmarks to construct a 3D scene graph from monocular video, improving robustness in low-texture scenes.
- Implemented a detection → data-association → pose-update pipeline in Python/OpenCV with consistency checks and outlier handling to keep object-anchored maps stable.
- Developed calibration and evaluation tools (intrinsic/extrinsic checks, reprojection diagnostics) and documented failure modes so map-quality issues can be reproduced and debugged quickly.

SKILLS

DevOps & Cloud: Docker; Git/GitHub; GitHub Actions; CI/CD pipelines; containerised services; REST APIs; AWS/Azure; Linux, CLI

Programming & ML: Python, C, SQL; NumPy, pandas, scikit-learn, PyTorch/ONNX, OpenCV

Data & Monitoring: ETL and data modelling; dataset versioning; deterministic train/val/test splits; structured logging and telemetry; KPI dashboards (Tableau/Excel); data-quality checks (counts, distributions, drift/anomaly flags)

Analytics: A/B test design and analysis; metric design and guardrails; funnel/retention/CVR analysis; time-series and Bayesian modelling

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SUMMARY

Software engineer with hands-on ML/AI and computer vision, building real-time systems from concept to demo. Built a multi-camera perception MVP and MLOps pipelines for data ingestion, time-series features and model serving. Skilled in Python/C, AWS/Azure, CI/CD, TDD and data modelling, using GenAI (LLM assistants/agents) to speed up scaffolding, tests and docs. Adept at communicating trade-offs (latency, accuracy, cost) and thriving in ambiguous environments.

EDUCATION

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BEng Electronic and Electrical Engineering (First-Class Honours)

Sep 2022 – Jun 2025

WORK EXPERIENCE

Software Engineering Intern — Coach Cube AI, London, UK

Jul 2025 – Aug 2025

- Owned the MVP for a **real-time perception service**; architected a **modular, model-agnostic design** with clean APIs and **built-in telemetry**, delivering an investor-ready demo in eight weeks and enabling rapid swaps of models/camera setups.
- Implemented ML-driven 2D detection (detector backbone) and 3D triangulation/single-view lifting; added lightweight filters to stabilize jitter and expose accuracy/latency metrics.
- Productionised the time-series **ML infrastructure** as a **containerised** service with **CI/CD**, **dataset versioning**, train/val/test splits, **data-quality checks** and **evaluation pipelines** to support regression-safe model iteration.
- Applied data modeling and evaluation to define robust schemas, instrument telemetry, and run bake-offs that balanced accuracy, frame rate, and cost for investor demos.
- Leveraged **GenAI** (LLM coding assistants and lightweight agents) to scaffold utilities, auto-generate test boilerplate, and accelerate documentation and code reviews.

Tech: Python, OpenCV, PyTorch/ONNX, NumPy, Docker, Git/GitHub, REST/JSON, AWS/Azure, Linux, CLI

RESEARCH EXPERIENCE

Hybrid Body Lab, Cornell University — Ithaca NY, USA

Jun 2024 – Sep 2024

- Developed the firmware + BLE protocol for a therapeutic glove (13 SMA actuators), plus Python tooling for calibration, **data logging**, and closed-loop control experiments.
- Shifted from hardware-first to software/controls-first approach: codified safety limits, fault handling, and repeatable test routines to enable later ML-based pattern analysis on collected signals.

UCL Computer Science Dept. — London, UK

Oct 2023 – Oct 2024

- Evaluated ML/CV rendering approaches for robotics/AR (e.g., Gaussian Splatting vs. traditional pipelines) to support **data generation** and **simulation**.
- Built Python metrics (IoU, reprojection error) to assess fidelity and generalization; quantified trade-offs and found fidelity was limited by input data quality, not the renderer.

UCL Surgical Robot Vision Group — London, UK

Jun 2023 – Aug 2023

- Engineered new signal conditioning filters for image-guided robotics, cutting control loop latency by over 25% to enable more responsive actuation and structured data logging.
- Authored documentation/tests for reproducible experiments; emphasized reliability and safety constraints over bespoke hardware tweaks.

TECHNICAL SKILLS

Languages: Python, C, SQL, MATLAB

Frameworks/Tools: Git, Docker, GitHub Actions/Jenkins, PyTest/JUnit, REST APIs

Cloud & Data: AWS/Azure, Postgres/MySQL, NoSQL, ETL & Data Modeling

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SUMMARY

Robotics perception engineer shipping real-time multi-camera 3D pipelines (temporal filtering, timing budgets) with instrumented latency/accuracy; Python/C, OpenCV, PyTorch/ONNX, ROS 2/Gazebo, Docker, CI/CD; controls rigor (safety, calibration).

EDUCATION

Imperial College London - London, UK
Human and Biological Robotics

Sep 2025 – Present MSc

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Electronic and Electrical Engineering (First-Class Honours)

Sep 2022 – Jun 2025 BEng

WORK EXPERIENCE

Software Engineering Intern - Coach Cube AI, London, UK

Jul 2025 – Aug 2025

- Shipped a real-time multi-camera 3D pose MVP with clean APIs & telemetry; investor demo in 5 weeks.
- YOLO 2D + triangulation/single-view lifting with temporal filters; surfaced latency/accuracy for trade-offs
- Dockerized REST service + live viewer; added CI/CD and unit/integration tests for safe iteration under time pressure.
- Instrumented timing budget & health checks (capture→detect→triangulate→publish) with structured logs and a short runbook to improve demo reliability.

Tech: Python, OpenCV, PyTorch/ONNX, NumPy, Docker, Git/GitHub, REST/JSON, AWS/Azure, Linux, CLI

RESEARCH EXPERIENCE

UCL Computer Science Dept. - London, UK

Oct 2023 – Oct 2024

- Built a robotics-applicable stack comparing Gaussian Splatting vs. panoramic/SfM; evaluated for perception tasks (tracking, mapping).
- Ran ROS 2 pipelines in Gazebo (camera/odom topics) -> reconstruction -> downstream perception; created reproducible launch/dataset scripts.
- Implemented ROS 2 ↔ Unity visualization; integrated PCL for point-cloud filtering/alignment and quantitative + qualitative checks.
- Framed selection criteria (fidelity vs. runtime/latency, memory, failure modes) and documented when/why each method fits robot sensing constraints.

Object-Centric SLAM (UCL EEE Final-Year Project) - London, UK

Sep 2024 – Jun 2025

- Designed object-based SLAM: objects as landmarks to build a 3D scene graph from monocular video; object tracks → pose-graph updates.
- Implemented detection → data association → pose update; improved robustness in low-texture scenes; produced object-anchored maps.
- Wrote calibration & evaluation tools (intrinsics/extrinsics checks, reprojection diagnostics); documented failure modes & mitigations.

UCL Surgical Robot Vision Group - London, UK

Jun 2023 – Aug 2023

- Built control-loop & signal-conditioning modules; prioritized latency stability and noise rejection under hardware constraints.
- Implemented fault-aware actuation (limits, watchdogs, safe states) and bench procedures with engineering documentation.

TECHNICAL SKILLS

Perception/CV: OpenCV, PyTorch/ONNX, multi-camera 3D (triangulation / single-view lifting), temporal filtering, datasets & evaluation (latency/accuracy)

Robotics SW: Python, C, Linux, Docker, REST/JSON, testing (PyTest, unit/integration), CI/CD (GitHub Actions)

Controls: safety interlocks, calibration & logging, closed-loop experiments

Tooling: Git/GitHub, MATLAB/NumPy, PCL, ROS 2/Gazebo