

DEBDEEP SANYAL

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OBJECTIVE

Android and AI/ML Engineer with **3 years of experience** building production Android systems and computer vision solutions. Experienced in real-time video analytics, model integration, and edge deployment, with a focus on scalable and reliable products.

SKILLS

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| Programming | Kotlin, Java, Python, XML |
| Android Engineering | Android SDK, Jetpack Compose, MVVM, RESTful APIs, SQLite, Firebase |
| Computer Vision | OpenCV, ML Kit, TrackNet, InsightFace, DeepFace |
| Deep Learning | CNN-based models, Object Detection and Tracking, Face Recognition |
| Sequence & Temporal Models | LSTM, BiLSTM, Transformer-based architectures |
| Model Training & Optimization | PyTorch, ONNX, TensorFlow Lite, CoreML, Quantization, Edge Deployment |
| Video & Media Processing | RTSP pipelines, GStreamer, FFmpeg, GPU-accelerated inference |
| Data Engineering | Dataset collection, annotation, validation, bias analysis |
| Developer Tools | Android Studio, Git, Python-based training pipelines, Google Cloud Console |
| System Skills | Multithreading, background execution, camera pipelines, performance tuning |

EXPERIENCE

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| Android & AI/ML Engineer Vareli Tecnac Pvt. Ltd. | Feb 2023 – Present <i>Kolkata, India</i> |
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- Owned end-to-end development and maintenance of production Android applications with emphasis on **performance, scalability, and reliability**.
- Built and deployed **on-device ML inference pipelines**, integrating **real-time data and media streams** for low-latency, production environments.
- Improved background execution and resource efficiency while collaborating closely with backend, QA, and hardware teams.

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| Research Intern Indian Institute of Technology (IIT) Ropar | May 2021 – Aug 2021 <i>Rupnagar, Punjab</i> |
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- Developed **hardware-level countermeasures** for **Row Hammer Attack** using **ECC and row refresh techniques**, achieving **30%** improvement in memory resiliency.
- Performed low-level memory performance analysis and benchmarking using **Valgrind** and **Intel PIN**.

PROJECTS

Play–Pause–Post (PPP): AI Sports Replay & Analytics Platform

Production-grade sports analytics and decision-support platform for badminton and racket sports.

- Implemented live ball and shuttle tracking systems with continuous model tuning for real-match conditions.
- Curated and annotated training datasets using **Roboflow** to ensure consistent production inference quality.
- Deployed **TrackNet-based tracking** with **90%+** accuracy and integrated paddle detection.
- Implemented **court keypoint detection** and geometric mapping to localize players, ball, and bounce points.
- Encoded **game rules logic** to determine rally outcomes, scoring, and valid play states.
- Integrated an automated **line-calling system** using bounce location and court geometry.

- Extended line-calling and replay insights to an **Android Watch application** for real-time officiating.
- Optimized inference pipelines for **iOS/CoreML and GPU execution** to support low-latency replays. ([Play Store Link](#))

CCTV-Based Face Recognition & Attendance Analytics System

Large-scale surveillance analytics system for automated employee attendance and insights.

- Implemented a **custom face recognition model** trained on **InsightFace and DeepFace backbones**.
- Designed real-time face analytics pipelines for high-volume CCTV feeds.
- Built reliable video ingestion using **GStreamer and RTSP pipelines**.
- Automated attendance tracking across multiple camera streams with temporal validation.
- Generated **heatmaps, headcounts, and time-based insights** for operational analysis.
- Improved robustness against occlusion, lighting variation, and pose changes in live environments.

V-Commute

Enterprise Android platform for employee commute tracking, attendance, and travel allowance management.

- Implemented geofenced real-time commute tracking with background execution optimization.
- Built **dynamic TA (Travel Allowance) calculation** based on vehicle type, distance, and usage patterns.
- Designed **automatic price management** with hierarchy-wise approval and finance validation workflows.
- Integrated **biometric and face-based authentication** with **99%+ accuracy**, anti-spoofing, and offline support.
- Developed a **lightweight on-device model** to ensure reliable authentication in low-connectivity environments. ([Play Store Link](#))

V-Fleet

Enterprise fleet and vehicle operations management platform.

- Built an **offline-first architecture** to support uninterrupted fleet operations in low-network regions.
- Implemented secure backend synchronization for vehicle, trip, and usage data.
- Enabled real-time vehicle status tracking and operational insights.
- Designed scalable data workflows for fleet monitoring and reporting. ([Play Store Link](#))

V-Asset

Enterprise Android solution for secure asset lifecycle and inventory management.

- Implemented JWT-based authentication with role-based access control.
- Integrated QR and barcode scanning using ML Kit for rapid asset identification.
- Implemented audit trails and asset history tracking to support compliance and traceability. ([Play Store Link](#))

iCan

Accessibility-focused Android application designed for **deaf users**.

- Built **sign-language-based storytelling videos** to support visual learning.
- Integrated **speech-to-text and text-to-speech** for two-way communication support.
- Designed an **assignment submission workflow** to track learning progress and engagement.
- Led a cross-functional team of 4 developers from design through delivery. ([Play Store Link](#))

EDUCATION

Master of Technology (M.Tech) in Computer Technology (AI & Data Science)
Jadavpur University, Kolkata

2024 – Present

Bachelor of Technology (B.Tech) in Computer Science and Engineering
I.K. Gujral Punjab Technical University, Punjab

2019 – 2023