

Arpit Benjamin

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Education

Birla Institute of Technology, Mesra Bachelor of Technology in Computer Science and Engineering	Sep 2023 – Present CGPA: 8.43/10
Indian Institute of Technology Madras BS in Data Science and Applications	Jan 2025 – Present CGPA: 8.44/10

Experience

VideoLAN Open Source Contributor (Google Summer of Code 2025) Proposal Final Report Developed VLC 4.0's Artist Albums view across Qt/QML, C++, and the Media Library backend , implementing album-grouped navigation, custom section delegates, playback controls, and search integration. - Extended VLC's C++ Media Library and Qt models with album metadata, SQLite search integration, and release-date sorting, implementing SQL query generation and C++ unit tests in a merged contribution. Reduced GPU memory pressure by approximately 30% by profiling QML rendering and introducing explicit lifecycle management for expensive shader effects. - Engineered sticky, variable-height album sections with custom QML delegates, handling dynamic geometry, scrolling, keyboard navigation, and grid/list sorting.	May 2025 – Sep 2025
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Embedded Systems & IoT – Summer Internship Hybrid Home Control Birla Institute of Technology, Mesra Developed communication and device-integration software for an ESP32-based home automation system , covering backend services, secure device management, and standards-based interoperability. - Developed a Flask/WebSocket/MQTT communication platform enabling bidirectional command delivery and real-time state synchronization between ESP32 devices and a web interface. - Implemented JWT authentication, role-based authorization, rate limiting, and audit logging; subsequently integrated ESP-Matter with Home Assistant for interoperable appliance control.	May 2026 – Jul 2026
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Projects

Pinnacle Dynamo 98-Second Demo Architect and primary developer of a 50,000+ line Python/PySide6 desktop application , used weekly in live production since 2023 for multimedia presentation, real-time playback, automation, and multi-display output. Reduced media-browser load time for 2,000 items from 6 seconds to 500 ms (~92%) through priority-aware asynchronous thumbnail scheduling, request deduplication, bounded Qt worker execution, and memory/disk caching. - Architected a process-isolated multimedia compositor with framed TCP messaging and shared-memory preview transport, decoupling playback from the editor UI and synchronizing frame access across processes. - Built an interactive Qt Graphics View slide editor supporting multi-object transformations, binary-search-based edge and center snapping, custom clipboard serialization, and command-pattern-based undo/redo. - Developed a reusable event-driven automation framework coordinating media playback, audio, output routing, and stage layouts through macros and slide triggers, with MIDI/OSC integration, hotkeys, and REST-based API. - Engineered a SQLite persistence layer with transactional schema migrations, relational integrity, recoverable deletion, SQL window functions for ordering repair, and application-wide undo/redo.	Sep 2023 – Present
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Solar Chain Python, Flask, C++, ESP32, Algorand - Developed a peer-to-peer energy trading platform integrating Flask, SQLAlchemy, Algorand smart contracts, and ESP32-based hardware. - Implemented C++ firmware for energy monitoring and control, using I2C sensors, GPIO-controlled transfers, and WebSocket messaging to coordinate physical energy transfer with backend transactions.	May 2024 – Present
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Awards & Achievements

1st Place: TechX Project Exhibition (2025, 2026); Battle of Bytes 2.0 (2025).
3rd Place: Algorand Road2Impact Developer Challenge (2024, Solar Chain); Battle of Bytes (2024).

Technical Skills

Languages: Python, C++, Java, C, JavaScript, SQL
Frameworks: Qt 6, PySide6, QML, Qt Widgets, FastAPI, Flask, SQLAlchemy
Databases & Tools: SQLite, MySQL, Redis, Git, CMake, Docker, Linux, GDB, Meilisearch
Systems & Networking: Multithreading, Multiprocessing, IPC, Shared Memory, TCP/IP, REST APIs, WebSockets, MQTT