Murali Krishna L

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Portfolio | LinkedIn | GitHub | Leetcode | Codeforces

EDUCATION

Rajalakshmi Engineering College   Tamil Nadu, India
Bachelor of Engineering, Electronics and Communication; CGPA: 8.15   **May 2025**
Don Bosco Matriculation Higher Secondary School   Tamil Nadu, India
SSLC and HSC, State Board; SSLC: 82.4% and HSC: 87.5%   **May 2021**

SKILLS SUMMARY

- **Code Stuff:** Java, Python (with Pandas, NumPy), SQL, R, C, Verilog, SystemVerilog, Bash basics — from writing backend services to digital circuit logic, I like building things that solve real problems.
- **Web & UI:** Built full-stack projects using React.js, Firebase Auth, and chatbot-style UIs — still learning advanced patterns, but love experimenting with frontend.
- **Dev Tools I Use:** Git, GitHub, Docker, Docker Compose, Postman, SolidWorks, Cadence Virtuoso, Vivado, Proteus — tools I've used across software apps and embedded design.
- **Cloud & DevOps:** Comfortable with AWS (EC2, IAM, S3), Firebase (Firestore, Admin SDK), planning CI/CD (GitHub Actions), and working in Linux environments (CentOS/Ubuntu).
- **Data & Databases:** MySQL (Stored Procedures, Window Functions, Triggers, Partitions), Firestore (real-time NoSQL), MongoDB basics, early-stage PySpark for large-scale data handling.
- **Platforms & Projects:** Worked on AI-driven DevOps chatbots, IoT systems, VLSI design flows, pre-silicon verification, and PCB prototyping — enjoy projects that blend software with hardware.
- **People Stuff:** Thrive in teams, pick up tech quickly, love to break down complex ideas for others, and bring creative solutions with a detail-focused mindset.

WORK EXPERIENCE

RESEARCH INTERN | Indian Institute of Technology, Madras (IITM)   **March 25- Present**
- Working on an international research project involving core research analysis, some data analysis skills and deep knowledge.
- Actively learning and applying necessary tools and skills that are required as part of the research process.

PROJECT TRAINEE INTERN | CODEXE Technologies   **July 24- October 24**
- Took part in developing multiple websites using both code-based stacks and no-code tools like WordPress.
- Assisted in hosting via platforms like Hostinger with domain setup, applying basic CI/CD concepts for deployment.

SOC DESIGN AND VERIFICATION INTERN | Tessolve   **July 24- December 24**
- Gained hands-on experience with Verilog/SystemVerilog, advanced verification techniques, and UVM methodologies for efficient design and verification of complex digital systems.
- Designed and verified a cryptographic encryption module using the AES encryption algorithm, achieving high test coverage through Verilog-based testbench development.

PROJECTS

AI DevOps Coach Chatbot | React.js, Node.js, Firebase, Gemini API, AWS, Docker   **May 25 – Present**
- Built a full-stack AI chatbot to analyze GitHub repos, tech stacks, and suggest CI/CD improvements using Gemini AI.
- Integrated Firebase Auth (Google/GitHub), Firestore DB, and Dockerizing frontend/backend hosting on EC2 with Compose.

Student Management App with CI/CD | Flutter, Firebase Auth, Firestore, GitHub Actions, Rclone   **May 25 – June 2025**
- Built a Flutter app for student registration and admin login, with email/password auth, verification, and Firestore-based profiles.
- Set up a CI/CD pipeline using GitHub Actions to auto-build APKs and upload to Google Drive via Rclone and secrets.

Multi-Cloud Data Transfer with AWS and GCP | AWS, GCP   **May 2024**
- Hands-on experience with transferring data between AWS S3 and Google Cloud Storage for redundancy and cost efficiency.
- Configured cross-cloud access using IAM roles, implemented real-time data sync via Amazon SQS, and resolved migration issues.

Automated Stock Update System | MySQL Stored Procedures   **April 2025**
- Created a stored procedure to automatically update product stock after each order.
- Used error handling with `SIGNAL` for stock insufficiency and logic for deducting quantities from stock.

Total Order Price Calculation | MySQL Function & Stored Procedure   **April 2025**
- Developed a function to calculate the total order price by summing `price * quantity` for all items in an order.
- Incorporated a stored procedure to integrate the function into the order processing system.

Wallace Tree Multiplier (4x4) | Verilog, Vivado   **February 25- March 2025**
- Created a 4x4 hierarchical Wallace Tree multiplier and verified output correctness via simulation.
- Optimized for speed by flattening partial product addition layers using combinational logic.

Missile Guidance Chip (Concept) | Verilog Logic + Simulation, Vivado   **February 25- March2025**
- ○ Simulated missile guidance logic with input response conditions and safety-check sequences.
- ○ Verified outputs under time constraints using basic assertion logic on Vivado sim interface.

Vehicle Driver State Estimation | Python, OpenCV, Mediapipe, NumPy, PyQt5   **January 25- March 2025**
- ○ Built a real-time driver drowsiness detection system using OpenCV, Dlib & Mediapipe; utilized facial landmarks and eye aspect ratio for alerting.
- ○ Integrated heart rate monitoring via facial video using SciPy; applied signal processing to compute real-time BPM accurately.

8-Bit RISC Processor | Verilog, SystemVerilog, Vivado   **January 25- February 2025**
- ○ Designed an 8-bit RISC processor with custom ISA, ALU, memory, and control logic using Verilog and RTL design.
- ○ Verified processor functionality with a SystemVerilog testbench and simulated in Vivado (XSIM) for debugging.

Traffic Light Controller | Verilog, FSM, Vivado   **November 24- December 2024**
- ○ Implemented a FSM-based traffic light controller with state transitions, timing control, and LED sequencing using Verilog.
- ○ Simulated and verified design in Vivado (XSIM) for correctness, efficiency, and low power usage.

E-Commerce Website | Front-end stack, JSON, Node JS, Express JS   **October 24- November 2024**
- ○ Developed a fully functional e-commerce site with features like product categories, payment integration, and JSON-based data storage.
- ○ Implemented an admin dashboard for sales tracking, enabling efficient management of inventory and transactions.

Cryptographic Accelerator | Verilog, EDA Playground, Vivado, Pipelining   **September 24- November 2024**
- ○ Developed AES-256 cryptographic accelerator using Verilog for FPGA/ASIC with enhanced encryption performance.
- ○ Optimized encryption speed and power efficiency using parallelism, pipelining, and key scheduling techniques.

CARLA: Autonomous Car Simulation | Python, Tensorflow, StableBaselines_3, CARLA   **March 24- May 2024**
- ○ Developed a reinforcement learning model for autonomous driving using CARLA and StableBaselines3, trained to navigate and make steering decisions.
- ○ Generated and tested an h5 model for real-time control, demonstrating practical applications of RL in autonomous vehicle simulations.

Smart Shopping Cart | Arduino C, Arduino Uno, IR Sensor, RFID, Servo, OLED display   **February 24- April 2024**
- ○ Designed a smart shopping cart with OLED interface, BO motors, IR sensors, and RFID for autonomous shopping.
- ○ Utilized Arduino UNO and a robotic arm with servo motors for advanced product handling.

CERTIFICATES AND COURSES

Oracle APEX Cloud Developer Professional Certification | Oracle   **May 2025**
- ○ Skilled in building low-code AI-powered applications using Oracle APEX, integrating RESTful services, and leveraging built-in ML features.
- ○ Applied knowledge in designing scalable, data-driven apps with intuitive UI and cloud deployment for business solutions.

Oracle AI Vector Search Professional Certification | Oracle   **May 2025**
- ○ Proficient in implementing vector-based AI search solutions, combining semantic search with traditional indexing methods.
- ○ Gained experience with embedding models, similarity search techniques, and enhancing search relevance in enterprise apps.

GitHub Foundations Certification | GitHub   **April 2025**
- ○ Proficient in Git and GitHub workflows, including branching, merging, pull requests, and conflict resolution.
- ○ Gained hands-on experience with version control, repository management, and collaborative development in projects.

Postman API Fundamentals Student Expert Certification | Postman   **March 2025**
- ○ Proficient in designing, testing, and documenting APIs using Postman's collaborative platform and built-in tools.
- ○ Completed hands-on exercises in requests, environments, collections, and automated testing for real-world API workflows.

Docker Foundations Professional Certificate | Docker   **January 2025**
- ○ Learned the differences between containers and virtual machines, along with their use cases.
- ○ Gained hands-on experience with Docker, including managing containers, using Docker Compose, and pushing images to registries.

SQL Essential Training | NASBA and Linkedin Learning   **January 2025**
- ○ Mastered SQL fundamentals, including writing efficient queries, utilizing joins, and designing relational databases.
- ○ Gained hands-on experience with advanced SQL techniques like subqueries, indexing, and query optimization strategies.

MongoDB Developer's Toolkit: CRUD Mastery | GeekforGeeks   **December 2024**
- ○ Mastered MongoDB features like CRUD, aggregation pipelines, and Javascript integration.
- ○ Completed 75+ videos and 100+ MCQs, enhancing data modeling and real-world application skills.

SOC Verification using System Verilog | TARAS Systems and Solutions   **July 2024**
- ○ Learned to verify SoC designs using SystemVerilog, focusing on functional, performance, and error detection testing.
- ○ Applied advanced verification techniques to ensure SoC design accuracy and reliability.

Embedded Systems and IoT | Tessolve   **February 2024**

- ○ Gained practical skills in embedded systems design and real-time IoT applications integration and got hands-on experience with the MSP430 Board from Texas Instruments.
- ○ Developed IoT solutions using sensors, communication protocols, and embedded systems for industry-specific challenges.

VOLUNTEERING AND WORKSHOPS

- Attended PCB Designing and Fabrication workshop conducted by our college ECE Department.
- Attended Basics of Solidworks and future of CAD works conducted by SEDS Society of our college.
- Led Design A Thon '24 at my college as part of a 4-member team, managing event logistics and other things.
- Onboarded 3+ new tech stacks in under two weeks, demonstrated by projects published on my GitHub and portfolio.
- Exploring Cloud and DevOps tech, focusing on automation, containerization, and CI/CD.