



EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2028	M.TECH Dual Degree 5Y	IIT Kharagpur	8.43 / 10
2023	Class XII (KSEAB)	Jnanasudha PU College, Udupi	96%
2021	Class X (CBSE)	Amratha Bharathi Vidya Kendra, Udupi	96.6%

PROJECTS

LLVM Compiler Infrastructure | Open-Source Contribution (C++) Feb '26 - Mar '26
(Objective: Authored and merged 10 PRs to optimize clang-doc rendering engines, and resolve clang-frontend crashes)

- Refactored **Abstract Syntax Tree (AST)** parsing pipeline in **Clang-doc** to explicitly trim raw comments immediately after extraction from the AST, preventing structural formatting inconsistencies across downstream documentation generators.
- Upgraded the **Clang-doc** HTML and Markdown output generators to explicitly display enum types, underlying values, and extracted comments, alongside implementing horizontal wrapping to properly format extended function definitions.
- Resolved **Clang-frontend** crashes during **constexpr int*** initializations and rectified **decltype(x)** mutability in lambda returns.
- Modernized LLVM test suites by migrating legacy validation directives and expanding **constexpr** initialization coverage.

Gosh - The Go Shell | Self Project (Go) Jan '26
(Objective: To build a custom, lightweight Unix command-line shell)

- Developed a concurrent Unix shell in **Go**, orchestrating OS-level process lifecycles, native command execution, and secure signal handling to guarantee stable, isolated environments with strict resource and memory cleanup upon termination.
- Engineered robust I/O **stream handling** via standard file descriptors for seamless process **pipelining** (**|**), **redirection** (**>**, **<**), and integrating a native Go readline library to enable robust dynamic **tab completion** and streamline interactive navigation.
- Supported execution of global **PATH** binaries and implemented core **shell builtins** (**cd**, **pwd**, **echo**, **type**, **history**).

Koneko | Self Project (Go) Feb '26
(Objective: To build a modern Hyprland rendition of the classic Win95 cursor-chasing cat Neko)

- Architected a cross-platform rendering loop and **Finite State Machine (FSM)** in Go to compute real-time, non-blocking sprite trajectories, maintaining feature parity on Windows via native **Win32 API** integrations for rendering the sprite overlay.
- Engineered a transparent, click-through **Wayland layer-shell** overlay, and bypassing strict client security isolation by dynamically polling the **hyprctl** interface via **Unix Domain Sockets** to achieve exceptionally low-latency global pointer tracking.

Omarchy | Open-Source Contribution (Bash) Oct '25 - Apr '26
(Objective: To customize and improve desktop utilities for an opinionated Arch Linux-based distribution)

- Scripted automated **Bash daemon utilities** to dynamically synchronize system-wide theming across VSCode and Chromium.
- Integrated a global search module into the application launcher, reducing sub-process execution times for rapid access.

Battery SOC Estimator | Course Project (Python, Go) Mar '26
(Objective: To model and estimate real-time battery State of Charge utilizing advanced control theory)

- Engineered a hybrid **Python** and **Go** pipeline for real-time State of Charge (SOC) estimation utilizing the **NASA Battery Dataset**, implementing an **Extended Kalman Filter (EKF)** and **Luenberger Observer** over a dynamic **Equivalent Circuit Model (ECM)**.

COMPETITION/CONFERENCE

Smart India Hackathon (SIH - 2025) | Campus Winners Sep '25
(Objective: Build a Smart Tourist Safety Monitoring and Incident Response System)

- Engineered a full-stack **mobile and web ecosystem** featuring real-time **SOS signaling** and **live location tracking**, proposing **blockchain-backed** digital identity verification to ensure highly secure tourist onboarding and incident dispatch routing.
- Architected a highly scalable **backend** incorporating **AI-based anomaly detection**, dynamic **geofencing alerts**, and real-time monitoring **dashboards** for tourism authorities, establishing a robust system design for automated **e-FIR generation** workflows.

SKILLS AND EXPERTISE

Programming Languages: C++ | C | Go | Ruby | Bash | JavaScript | Python | SQL | HTML | CSS | MATLAB.

Frameworks / Libraries: LLVM/Clang Compiler Infrastructure | C++ STL | Ruby on Rails | Node.js | Express | ReactJS.

Tools & DevOps: CMake | Make | Ninja | GDB | VSCode | Visual Studio | Git | GitHub | GitHub Actions | Docker.

Platforms & Databases: Linux (Arch/Ubuntu) | AWS | Simulink | Simscape | PostgreSQL | MongoDB.

COURSEWORK INFORMATION

Computer Science & Mathematics: Algorithms - I | Programming and Data Structures (Theory + Lab) | Fundamentals of Embedded Control and Software | Linear Algebra, Numerical and Complex Analysis | Transform Calculus | Theory of PDE.

Core Engineering & Applied Mechanics: Basic Electronics | Operations Research | Rechargeable Battery Performance Modelling | Thermodynamics | Mechatronics Laboratory | Fluid Mechanics | Dynamics | Kinematics and Kinetics of Machines.

AWARDS AND ACHIEVEMENTS

- Demonstrated algorithmic proficiency by solving **300+** problems on LeetCode and Codeforces, **50+** Advent of Code challenges.
- Competitive Programming enthusiast and an active participant in regular **Codeforces** contests with a peak rating of **1355**.