Om Pranab Mohanty

Systems Modeling & Architecture Enthusiast

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PROFILE

Undergraduate in Mathematical Sciences & Computing with focus on operating systems and RISC-V architecture. Builds low-level, theory-driven models bridging hardware and software, with hands-on experience in system simulation and formal analysis.

EDUCATION

B.S. (Hons. with Research) in Mathematical Sciences and Computing, *Sri Sathya Sai Institute of Higher Learning* 07/2023 – Present
Puttaparthi, Sri Sathya Sai District, Andhra Pradesh

Intermediate Education, *Sri Sathya Sai Higher Secondary School* 07/2021 – 04/2023
Puttaparthi, Sri Sathya Sai District, Andhra Pradesh

PROJECTS

OS Synchronization As Symmetric Restriction in Sn , 02/2026 – Present
Group Theory On Operating Systems

Developed a mathematical model of OS synchronization using permutation groups, enabling structured analysis of scheduling, mutual exclusion, and fairness; supported by Python-based verification.

A Control-Theoretic Study of Network Queue Regulation Using Lyapunov Stability 02/2026 – 02/2026

Modeled network congestion as a continuous-time dynamical system, treating sending rate as control input and queue length as state; analyzed stability using Lyapunov methods and validated smooth rate control via simulation.

Energy-Aware Task Scheduling using Calculus of Variations 02/2026 – 02/2026

Applied calculus of variations to derive optimal energy-aware scheduling under deadline constraints; proved constant-rate execution optimality and validated results through first-principles simulation.

SKILLS

Systems & Architecture: Operating Systems, RISC-V Basics, Computer Architecture

Programming: Python, C/C++

Mathematics: Discrete Mathematics, Group Theory, Algorithmic Modeling

Hardware & Design: Digital Design, Hardware Description Languages (SystemVerilog)

Tools: Git, GitHub, VS Code, Linux

Core Strengths: Analytical Thinking, Problem Solving, Research & Technical Writing

INTERESTS

Computer Architecture & RISC-V | Systems Modeling & Optimization |
Mathematical Foundations of Computing