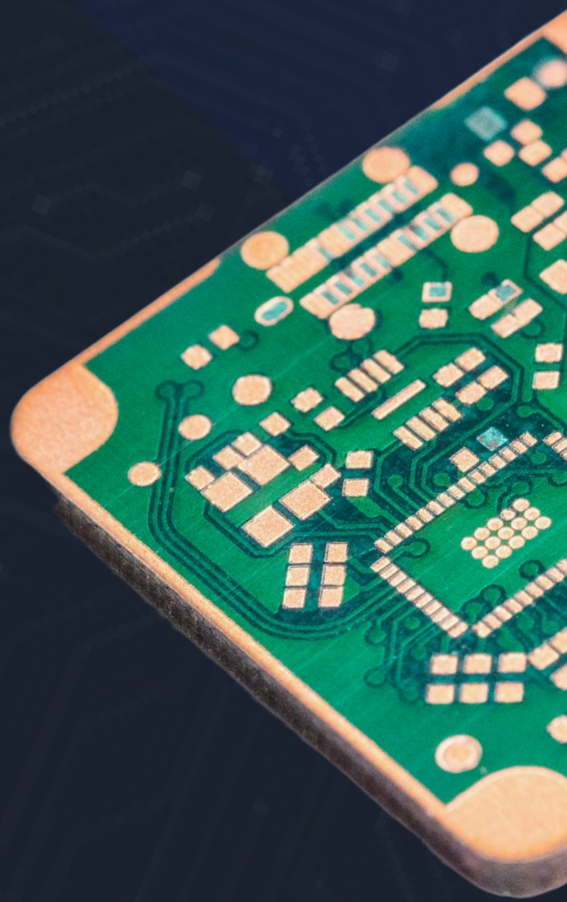
ROLOS
Engineering

COMPANY PORTFOLIO

2025

rolos.tech



ROLOS Engineering

Introduction

ROLOS Engineering delivers high-performance solutions in **embedded systems, power electronics, product design, and applied electromagnetics**. We help visionary teams bring complex ideas to life—from early prototypes to production-ready systems.

Our expertise spans **firmware development, real-time control systems, custom PCB design, electromagnetic modeling, and system integration**. We focus on building **reliable, scalable, and ready-to-manufacturable** technology tailored to your needs.

At **ROLOS**, we believe in precision, and doing things with intent. Every project is a partnership—driven by innovation, grounded in technical excellence, and built to exceed expectations.

What can we do for you?

From idea to a fully operational product or any number of stages in between, we operate across the board delivering high-performance systems

Core offerings include full-scale development of:

- Embedded Systems
- EMI/EMC Compliant Devices
- Instrumentation & Telemetry Systems
- Industrial Power Electronics/Drives
- Digital Signal Processing Systems
- Automatic Control Systems
- Custom Circuits & Systems
- Precision CAD Modeling
- Multi-layer PCBs

IP & Analytical Services

- Dynamic Modeling: Physical Systems
- SI/PI (Signal/Power Integrity Analysis)
- Mixed-signal Circuits IP
- Need-specific IP

ROLOS Engineering

Why choose us?

10+
Years

A decade of combined experience in product development across healthcare, automotive and real-time systems

Power electronics, electromagnetics and embedded — all handled by seasoned specialists.

Specialized Equipment

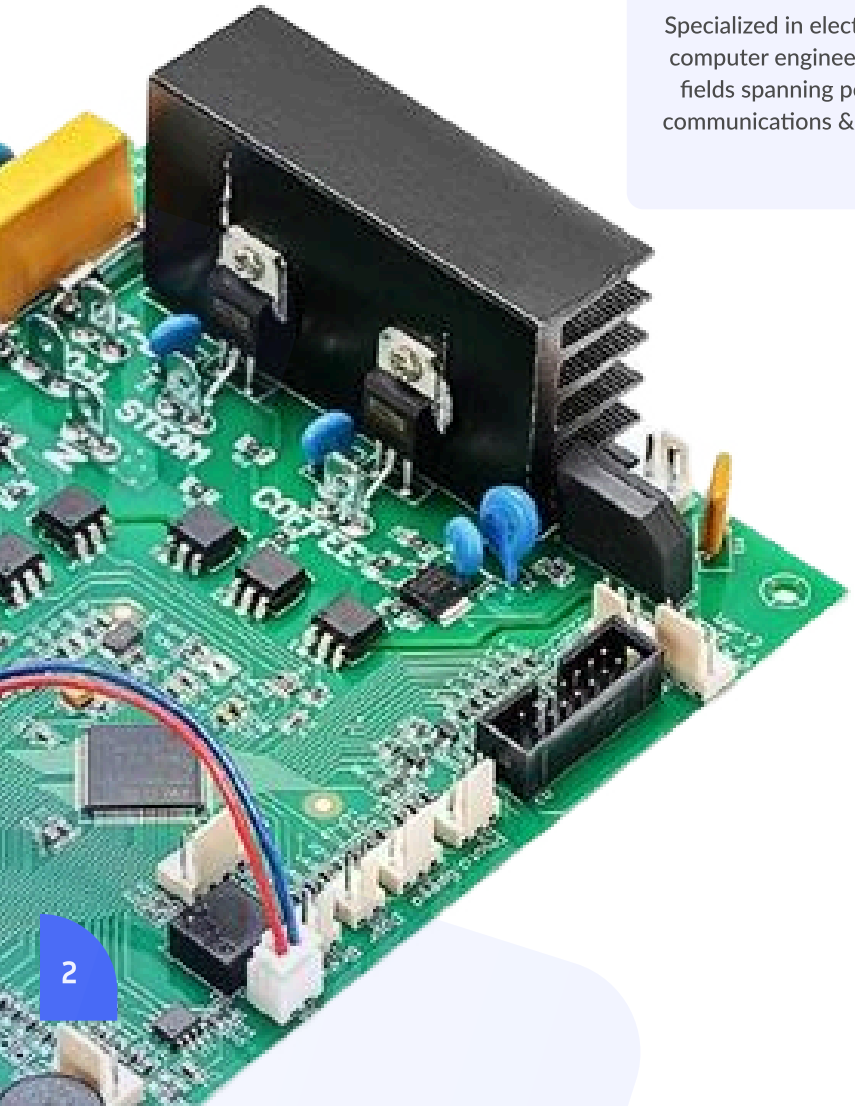
In-house test equipment for swift test/validation and project turnaround

6
Engineers

Specialized in electrical & computer engineering in fields spanning power, communications & AI/ML

Guarantee on quality thresholds

We work with clients to develop detailed product quality thresholds to ensure full commitment to deliver standout solutions



Engineering the unseen — from signal, to systems.

ROLOS Engineering

Meet our Engineers

Polarj Sapkota

Polarj Sapkota is an experienced electrical engineer specializing in multilayer PCB design, high-voltage systems, and instrumentation. He has contributed to medical imaging systems at GE and developed telemetry circuits for electric motorcycles, bringing precision and reliability to every hardware project he undertakes.

@polarj.sapkota | polarvector.github.io

Give me a motor—I'll stare at it for three days.
Electrical Tesla

Bishal Neupane

Bishal Neupane is an embedded software engineer at Yatri Motorcycles, specializing in real-time systems and low-level firmware development. With a strong background in computer architecture, he has built emulators, custom tools, and contributed to high-performance embedded platforms in the automotive domain.

@earthPerson-001 | in/bishal-neupane

I once spent three days debugging a Linux driver issue. Turned out it was just an unconnected I2C wire
Software Detailist

ROLOS Engineering

The Brain Behind the Tech

Nirjal Bhurtel

Nirjal Bhurtel is currently an Embedded Software Engineer at Yatri Motorcycles. He has worked across a wide range of tech products and co-founded a tech startup that successfully raised funding. With deep expertise in firmware, systems design, and IoT, he brings versatility and leadership to every project.

@nirjalbhurtel | nirjalbhurtel.com.np

> I can make any software in a week, man.
> **Software Generalist**

Saurav Paudel

Saurav Raj Paudel is an embedded systems engineer and Formula Student VCU lead at Team Urja. He specializes in real-time firmware, custom ISA design, and FreeRTOS-based task management. His expertise spans CAN communication, PID control, and safety-critical systems, with projects including a 16-bit processor on FPGA and NES emulation in Rust.

@Sauravrp67 | in/srp0x45

> I built a CPU on a breadboard just to see how fetch-decode-execute actually works.
> **Hardware Realist**

ROLOS Engineering

Our Porfolio

Yatri Motorcycles

Nirjal and Bishal currently work at Yatri Motorcycles, focusing on advanced embedded systems, vehicle technologies, and innovative electric mobility solutions.

Cymbiosys

Polarj led Cymbiosys' tech & strategy, creating Cymbios—an ultra-low-power, self-sustaining acoustic sensor network with real-time sound detection, localization, and classification to monitor and protect remote, vulnerable ecosystems.

Autoffic

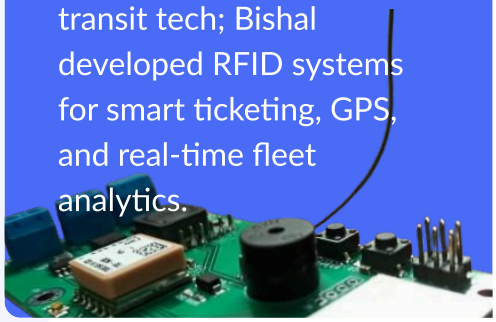
Nirjal and Bishal developed Autoffic, a hybrid traffic management system using reinforcement learning, and published a paper on its adaptive control for reducing urban congestion using IoT

RISC-ME

Nirjal built RISC-ME, an 8-bit FPGA computer in Verilog with custom assembler and architecture.

Omnecal

At Omnecal, Nirjal led transit tech; Bishal developed RFID systems for smart ticketing, GPS, and real-time fleet analytics.



DLR

Polarj built an IoT system capable of relaying thermal parameters of high-voltage transmission lines in real-time with an industrial-grade accuracy.

SoundID

Polarj built a 3D electro-acoustic sound localization system for security and entertainment.

Team Urja

Saurav leads VCU firmware development using STM32, FreeRTOS, CAN.

ROLOS Engineering

Code & Circuits

6502 Emulator

Bishal created an emulator for the 6502 processor, demonstrating expertise in low-level system architecture and emulation.

R-peaks

Saurav created an ECG system to detect R-peaks to determine frequency of heatbeats.

Dye-injection

Polarj designed an industrial dye-injection control system that mixes dyes into drugs with extremely tight constraints for the pharmaceutical industry

Rotary Inverted Pendulum

Saurav built a rotary inverted pendulum with Arduino and PID control for real-time stabilization.

8-bit hardware

2 of our engineers: Polarj & Saurav have individually built complete hardware for an 8-bit computer with Von-Neumann and SAP-1 architecture

Haptics

Polarj built a haptic feedback system for modern joysticks with accurate hand position tracking, vibration profile setting and appropriate vibration response.

16-bit Processor

Saurav implemented a 16-bit processor on Xilinx's FPGA

SI/PI & EMI/EMC

Polarj conducted signal integrity and EMI/EMC analysis for GE HealthCare's high-speed communication circuits

Engineering is closest thing to magic that exists in the world.

ROLOS Engineering

Contact Us

+977 986-1901306

hq@rolos.tech

Kathmandu, Nepal