Resume

Krishna Kumar Sah

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Personal Profile

Self-motivated, adaptable, and ambitious Electrical and Electronics Engineer with a strong drive for productivity, seeking to further my career in the IoT field.

Work Experience

Apr 2022 to Present

CTO [Full-Time]
Nepal Digital System Pvt. Ltd.
Our Clients:
- ➢ Hypnotik/Fantom (June 2024 to Present)
- ➢ Ezlo Innovation (Apr-2022 to Jan-2025)

Feb-2025 to Present

Embedded Engineer [Full-Time]
Hypnotik Io, and Fantorm LED
Responsibilities:
- ➢ Leading teams (Cloud, Web, Mobile, and Firmware Development)
- ➢ Firmware Development
  - ○ RS485 Distribution Box (JIECANG RS485 Shades)
  - ○ Hypnotik Leap Bridge
- ➢ App Development:
  - ○ App for provisioning and controlling Hypnotik Leap Bridge

June-2024 to Jan-2025

Embedded Engineer [Freelance/Part Time]
Hypnotik Io, and Fantorm LED
Tasks:
- ➢ Development of Hypnotik Leap Bridge (Lutorn-Dooya Bridge)
- ➢ Feature addition: WLED OTA based on AWS-Jobs

Apr 2022 to Jan 2025

Lead Firmware Engineer [Full-Time]
Ezlo Innovations Inc., (Remote, USA)
Responsibilities:
- ➢ Ezlo_Pi: Firmware framework development

Sep 2020 to April-2024

Embedded Engineer [Consultant]
Agrobotics Nepal Pvt. Ltd., Lalitpur, Nepal
Responsibilities:
- ➢ Leading Hardware development
- ➢ IoT Platform Engineer (Thingsboard)
- ➢ Firmware developer
  - Cattle monitoring BLE-sensor node
  - Soil sensor Nodes
  - BLE Gateway
  - Things-board IoT platform

Aug 2019 to Feb 2022:

Team Lead, and Sr. Embedded Engineer [Full-Time]
Bottle Technology Pvt. Ltd., Jhamsikhel, Lalitpur, Nepal
Responsibilities:
- ➢ Team Lead (Hardware, App, Firmware, Cloud, and Web)
- ➢ Sr. Firmware Developer

Aug 2016 to Aug 2019:

Firmware Engineer [Full-Time]
Real Time Solutions, Dhobighat, Lalitpur
Responsibilities:
- ➢ Project manager (Building Management System)
- ➢ Firmware Engineer

Aug 1, 2018 to Aug 8, 2018 :

Trainer [Contract]
Cosmos College of Management and Technology, Talchikhel, Lalitpur, Nepal
Responsibility:
- ➢ 21-hour Training/Workshop on Raspberry Pi with Python, PHP, JavaScript, CSS, HTML.

Education

May 2022 to May 2024

KFA Business School (Master)
Mid-Baneshwor, Kathmandu, Nepal
Master in **B**usiness **A**dministration **[MBA]**

July 2012 to August 2016

Kathmandu University (Bachelor)
Dhulikhel, Bagmati, Nepal
Bachelor in Electrical and Electronics Engineering (Communication)

2010 to 2012

Caribbean College (High School)
Manbhawan, Lalitpur, Nepal
10+2 in Science

Skills

- ***Programming language:*** **C, C++, Python, Dart,** Assembly (8085, 8086), HTML, JavaScript, CSS, Matlab, PHP, Java
- ***Communication protocols:*** BLE, Matter, LWIP(TLS/SSL), MQTT, SNTP, SMTP, Modbus(RTU/TCP), LEAP, etc.
- ***Hardware Interfaces:*** I2C, SPI, UART/USART, CAN, SDI, Wi-Fi, Bluetooth, Ethernet, ADC/DAC, PWM, SD, USB, etc.
- ***Worked on Chipsets/MCUs/boards:*** Espressif (ESP8266, ESP32/S3/C3), Seeed Xiao nrf52840 BLE sense, Raspberry-pi, Cortex-M4 (STM32), Cortex-M3 (LPC1857, LPC1778, LPC1768, LPC111x, EFM32G/GG), Atmel's, PIC, AVR, etc.
- ***IOT platform:*** Ezlo IoT Core, AWS IoT core, Things-Board, Upswift, RTS's proprietary, etc.
- ***Hardware Design:*** Altium, Eagle, Proteus, Multisim, KiCad, etc.
- ***Robotics (Online courses):*** Introduction to robotics, Robotics Vision
- ***FPGA:*** Verilog in Xilinx (VHDL)
- ***SDK/Frameworks:*** ESP-IDF, Tasmota, WLED, ESPEasy, etc.
- ***Additional skills:*** Android, Flutter, Machine learning, design-pattern (Singleton, etc.), Agile, etc.
- ***Project management:*** Jira, ODOO/ERP, Trello, Sheet, etc.

Projects

Application Firmware and C library development for the following:

- **Hypnotik RS485 Distribution Box:** ESP32S3 Box which has two STM32. Each STM32 servers its 5 UARTs to RS485 transceivers. Each RS485 is attached to a JEICANG RS485 shade.
- **Hypnotik-Leap-Bridge:**
    - ***Firmware***: Creates a bridge between Lutron-bridge and Dooya-bridge. It allows controlling Dooya shades using Lutron remotes. Leap protocol has been used for this project.
    - ***Flutter App***: To provision the leap bridge, Create Scenes to link Hypnotik Scene controllers to control Dooya shades.
- **Tasmota Firmware Customization:** Added mcp39f511 driver
- **WLED Customization:** Adding AWS-IoT support including OTA updates
- **Ezlo_Pi:** Developed an open source embedded framework (all in one sensor/device) for esp32/s3/c3 based on ESP-IDF. It includes drivers for around 60 sensors/devices.
- **BLE Wrapper:** Written a BLE wrapper over esp-ble for easy integration of multiple services, characteristics and descriptors.
- **Switch-Box:** Contains 10 relays, Can be switched individually or all with a supper switch.
- **Cattle Wearing Sensor:** It uses Seeed XIAO nrf52840 BLE sense module. Reads accelerometers values and stores in an interval of 100ms and sends the stored data to BLE gateway (based on esp32s3) in an interval of 5 min. The BLE gateway then sends data to the thingsboard cloud.
- **POS:** A POS machine incorporating contactless cards. E.g. NFC-Desfire EV1/EV2.
- **IoT Platform:** Design own IoT platform, and installation and operation of thingsboard IoT platform
- **Kiosk:** Designed and developed interactive kiosk in a team for better user experience
- ***Building Management System:*** Control and monitor temperature, humidity, and carbon-dioxide contained in the buildings. Includes: HMI Unit, SCADA software, damper controllers, Relay/Triac controllers, analogue front end, temperature sensors, air velocity sensors, and a main controller unit (PLC, or RTDL— developed in RTS).

- ***Infrastructure monitoring:*** All-in-one architecture and firmware development for multiple sensors. This includes water spill/leakage sensor, water flow sensor, motion sensor, door sensor, temperature and humidity sensor, etc.
- ***Audio Remote Terminal Unit:*** Used as an early warning system over FTP, RTSP, and MQTT.
- ***Queue Management System:***
    - Token printer
    - QMS speaker: Announces token number
    - PSIU: A power and signal interface unit. This system is used to port older QMS displays to new QMS system architecture
- ***Sensor interface library:*** iSYS_6003-RADAR level sensor, MCP3421 18-bit ADC, SHT3x (temperature and humidity sensor), NFC-PN532 – RFID and Near Field Communication (MI fare card).
- ***Web server:*** Webpages to be stored on SD card for embedded system over netconn-api.
- ***Porting and API development:*** MBED-TLS/SSL over NETCONN API on embedded system for lower footprints.
- ***Weather Display:*** Shows real-time data from Tribhuvan International Airport - temperature, humidity, wind speed, rainfall, clock over SNTP, etc.
- ***Communication Module:*** It uses iridium satellite modem, Dual SIM modem(3G-GSM-GPRS) and CDMA modem for Data communications.
- ***Smart Energy meter:*** Post Current, Voltage, Energy, Power, over MQTT, TSS and SMTP protocol. It also generates overcurrent and overvoltage alert messages.
- ***WCS:*** **W**ireless **C**alling **S**ystem for restaurant, hospital, etc. over Wi-Fi and UDP protocol.
- ***UART sniffer:*** Real-time monitoring the Rx and Tx lines, and post as MQTT message.
- ***Test Firmware:*** Check hardware health and quality of device's peripherals for RTDL (Real Time Data-logger), CDCP (Compact data collection platform), Communication Module, Wireless Keypad, etc.
- ***Protocol Converters:*** Conversion from/to RS232, RS485, TTL, SDI, and vice versa for Grimm PM sensor, MB7389-120 Sonar Range sensor, gas analyzer, etc.
- ***College Projects:***
    - ***Analysis of motion vector in video compression [Matlab simulation] (4th year)***
    - Quiz buzzer for IT-Quiz 2016 (4th year)
    - LHT (Luminance, Humidity and temperature) data-logging in micro-SD card (4th year)
    - Real-time vehicle tracking system using GPS and GPRS Module (4th year)
    - Vending Machine (3rd year)
    - 3-band Audio equalizer and amplifier (2nd year)
    - Light sensitive switch (1st year)

References:

References will be provided on request.