Raunak **Mukhia**

RESEARCH ASSOCIATE · SOFTWARE ENGINEER

📱 (+66) 0971606984 | ✉ raunak.mukhia@gmail.com | ⬛ www.github.com/rmukhia | ⬛ www.linkedin.com/in/mukhia

Summary

I am a Research Associate and Software Engineer with experience in Linux System Development, Embedded System development, Network Programming and Web Technologies. I am passionate about learning new technologies. In the course of my education and career, I have been exposed to a wide range of technology domains. Hence, I believe my core strength lies in adapting to changing and new technology environments and delivering results.

Research Experience

IntERLab, Asian Institute of Technology
Bangkok, Thailand

RESEARCH ASSOCIATE
May 2022 - Present

- Conducted data analysis and research on data collected from deployed environmental sensors.
- Integrated multiple sensor modules (BME280, MHZ16, PMS7003, etc.) and communication modules (SimCom7600H, CMWX1ZZABZ, ESP32) into an IoT platform, developing a real-time remote sensor system for air quality monitoring using LoRaWAN, WiFi, and cellular communication.
- Designed and implemented a sensor fleet management application to streamline monitoring and data collection.
- Developed and deployed a scalable, multi-process, real-time system for collecting, and processing air quality sensor data.

IntERLab, Asian Institute of Technology
Bangkok, Thailand

RESEARCH CONSULTANT
Feb. 2021 - Apr. 2022

- Developed and tested software for ESP32-based sensor devices aimed at haze monitoring and forest fire detection.
- Contributed to the hardware design and testing of custom sensor boards tailored to environmental monitoring.
- Deployed and managed a private LoRaWAN network server for reliable sensor communication.
- Experiments and research on the capabilities and optimization of LoRaWAN technology.

IntERLab, Asian Institute of Technology
Bangkok, Thailand

STUDENT RESEARCH ASSISTANT
Mar. 2019 - Jan. 2021

- Integrated LoRaWAN software stack into IoT air quality sensors for remote monitoring.
- Developed a Python-based LoRaWAN data server application for efficient data collection and transmission.
- Created a React Native mobile application for "BangPun: Distributed Ledger for Rural Communities", enabling blockchain-based solutions for rural development.

Software Engineering Experience

Regional Integrated Multi-Hazard Early Warning System (RIMES)
Remote

INDIVIDUAL CONSULTANT, EMBEDDED SYSTEMS DEVELOPER
2024

- Prototyped and conducted feasibility studies on a LiDAR-based real-time river monitoring system.

Freelance
Remote

FREELANCER
2017 - 2018

- Developed a web-based issue ticketing system via SMS using Node.js, Express.js, Backbone.js, and MongoDB.
- Built a PHP Laravel-based website for resort.

Ixia, Keysight Technologies
Kolkata, India

SOFTWARE ENGINEER II
Apr. 2015 - Jun. 2016

- Contributed to the integration of HTTP/2 support for the BreakingPoint platform.
- Prototyped "BreakingPoint VE" using DPDK, analyzing its feasibility and performance impact.
- Developed software virtualization for BitBlaster (L2 packet generator) and Routing Robot (L3 packet generator) modules, modeling FPGA hardware for "BreakingPoint VE."
- Deployed a Docker registry and automated Docker scripts for hosting and building development environment images for BreakingPoint.
- Mentored an intern in the development of an internal resource reservation web application using Django, AngularJS, and MySQL.

Ixia, Keysight Technologies
Kolkata, India

SOFTWARE ENGINEER I
Jul. 2013 - Apr. 2015

- Enhanced system stability by fixing critical bugs in the BreakingPoint platform.
- Contributed to the development of BreakingPoint VE, the virtualized version of the platform.
- Implemented various performance improvements for BreakingPoint VE to optimize its efficiency.

Ixia, Keysight Technologies   *Kolkata, India*
INTERN   *Dec. 2012 - Jun. 2013*
- Developed a web-based automated build management tool using Django to streamline development workflows.
- Designed and built a unit testing and mocking framework for C, supporting both user-space and kernel-space applications.

Publications

The 18th Asian Internet Engineering Conference (AINTEC 2023)   *Hanoi, Vietnam*
PAPER PRESENTER   *Dec. 2023*
- Raunak Mukhia, Kalana Gayashan Sarambage Jayarathna, and Adisorn Lertsinsrubtavee. 2023. Performance Evaluation of LoRaWAN Forest Fire Monitoring Network in the Wild. In Proceedings of the 18th Asian Internet Engineering Conference (AINTEC '23). Association for Computing Machinery, New York, NY, USA, 96–104. `https://dl.acm.org/doi/10.1145/3630590.3630602`

Workshops

ICTP-UNU Workshop on TinyML for Sustainable Development   *United Nations University, Macau*
PARTICIPANT   *Apr. 2024*

UNU Macau AI Conference 2024   *Macau*
ATTENDEE   *Apr. 2024*

55th Meeting of the Asia-Pacific Advanced Network (APAN55)   *Kathmandu, Nepal*
TRAINING PRESENTER   *Mar. 2023*
- Workshop on Information Centric Networking on Internet of Things (ICN-IoTs).

The 15th Asian Internet Engineering Conference (AINTEC 2019)   *Phuket, Thailand*
POSTER PRESENTER   *Aug. 2019*
- BangPun: Distributed Ledger for Rural Communities.

Education

Asian Institute of Technology (AIT)   *Bangkok, Thailand*
MASTER OF ENGINEERING IN COMPUTER SCIENCE   *Jan 2018 - Jan 2021*
- Thesis: Autonomous Multi-Agent Aerial Mapping using Structure from Motion and Wireless Mesh Network. `http://dx.doi.org/10.13140/RG.2.2.17759.68003`
- Relevant Fields: Robotics, Machine Vision, Network Programming, Embedded Systems.

International Institute of Information Technology Bangalore (IIITB)   *Banglore, India*
POST GRADUATE DIPLOMA IN DATA SCIENCE   *2017 - 2018*
- Capstone Project: Market Mix Model for Optimal Budget Allocation.

Sikkim Manipal Institute of Technology (SMIT)   *Sikkim, India*
BACHELOR OF TECHNOLOGY, COMPUTER SCIENCE AND ENGINEERING   *2009 - 2013*
- Major Project: Framework for Unit Testing of user space and kernel modules in IxLoad".

Skills

PROGRAMMING LANGUAGES
- C, Python, JavaScript, C++, SQL, Bash

TECHNOLOGIES & TOOLS
- *Embedded Systems Development:* Experience in embedded systems development.
- *Data Science & Analytics:* Experience with data processing, statistical analysis, and visualization using tools like Python (pandas, NumPy, Matplotlib), and Jupyter notebooks.
- *Microcontroller Programming:* Experience in low-level programming for microcontrollers (e.g., ESP32, STM32, ATTINY).
- *Network Programming:* Experience in socket programming, protocols, and designing communication systems.
- *Linux System Programming:* Strong background in developing system-level applications, scripting, and debugging in Linux environments.
- *Web Development & Deployment:* Experience in building and deploying full-stack web application.
- *Docker & Virtualization:* Experience in containerization and orchestration using Docker, and Docker Compose.
- *Robot Operating System (ROS):* Experience in using ROS for robotics development, including sensor integration, control systems, and path planning.
- *Machine Vision:* Experience in computer vision techniques using libraries like OpenCV for object detection, image processing, and automation.

Awards

2015	**E-Staff Excellence Award**, For working as a team enabler and knowledge sharing to engineering team.	*Ixia*
2015	**Spot Award**, Appreciation towards knowledge sharing to engineering team.	*Ixia*
2014	**Spot Award**, Appreciation for work leading to performance impact on product feature.	*Ixia*
2013	**Certificate of Appreciation**, In appreciation for work as an intern at Ixia Technologies.	*Ixia*
2009	**Amul Vidhya Bhushan**, Outstanding academic performance at the Central/State Board Higher Secondary Examinations	*High School*