

# Sudhan Bhattarai

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📍 Kathmandu, Nepal

👤 Sudhan Bhattarai

## Profile

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I am a highly motivated Software Developer with a strong passion for Backend Development, AI Systems and Cloud Computing. My journey in technology is driven by curiousness and a deep fascination with how computers work. I have a growth mindset and love exploring the nuance aspects of Software and continuously learning, and pushing the boundaries of what I can build.

Over the years, I have developed applications that not only cater to personal needs but also address real-world challenges through innovative solutions in Web Development, Predictive Modeling, and Data Science Applications and Agentic AI Systems. I am proficient in solving complex problems, designing scalable systems, and optimizing performance to build efficient and impactful solutions. Apart from continuous exploration and adaptability I love embracing challenges as opportunities for growth.

## Professional Experience

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06/2025 – Present  
Lalitpur, Nepal

**Associate Software Engineer**  
*YCOTEK Nepal Pvt. Ltd.*

- Built and maintained RESTful APIs using Django and Django REST Framework including schema design and database migrations using Django ORM.
- Integrated WebSocket connections to stream real-time agent responses to the frontend, handling incremental LLM output delivery
- Managed asynchronous workflows using RabbitMQ for task queuing, tool execution, and system resilience
- Used PostgreSQL as the primary database, writing optimized queries for multi-tenant data isolation
- Designed and integrated fuzzy string matching algorithms to enhance data retrieval accuracy and intent recognition in user queries
- Contributed to scalable agent architecture, optimizing LLM interactions, memory management, and tool orchestration
- Implemented advanced NLP solutions for an agentic AI platform using LangChain and LangGraph, enabling structured reasoning and multi-step task execution
- Developed an agentic AI system for natural language to SQL generation using LangGraph and LangChain
- Designed and implemented LLM tool calling to interface external services
- Wrote unit and integration tests for REST API endpoints and agentic LangGraph workflows, maintaining backend reliability

03/2025 – 06/2025  
Lalitpur, Nepal

**Software Engineer Intern.**  
*LIS Nepal Pvt. Ltd.*

- Designed and implemented a Proof of Concept (PoC) system leveraging Microfrontend architecture using React.js and Angular, using webpack as a bundler and integrated with Microservices.
- Utilized Webpack Module Federation to enable seamless cross-framework integration and demonstrate scalable, modular application development.
- Built a Role-Based Access Control (RBAC) system using the Django web framework, featuring secure authentication, permission management, and user role hierarchics.
- Conducted in-depth research on Microfrontend architecture, exploring key concepts, integration strategies using Webpack Module Federation, and best practices for cross-framework interoperability and performance optimization.

## Education

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2021 – 2025  
Dhulikhel, Nepal  
**BSc. Computer Science**  
*Kathmandu University*  
**CGPA 3.93**

2018 – 2020  
Dillibazar, Kathmandu,  
Nepal  
**Grade 12 | Science**  
*Trinity International College*  
**GPA 3.78**

## Technical Skills

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### Language

Python | C/C++ | JavaScript (Browser, Node.js) | TypeScript

### Tools and Libraries

Git | Azure | Pandas | NumPy | AWS (Basic) | RESTful APIs | RabbitMQ | Redis | Agentic AI | WebSocket

### Database Management

MySQL | PostgreSQL | MongoDB | Prisma ORM | DjangoORM

### Framework

Express.js | FastAPI | React.js | Svelte | Material-UI | Angular | Django | LangChain | LangGraph

## Projects

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### Movie Ridge

*A movie hosting, recommendation, and broadcasting app connecting movie enthusiasts.*

- Developed a personalized recommendation engine using Cosine Similarity Index and TMDb dataset to suggest movies based on user watchlists.
- Implemented WebRTC-based peer-to-peer broadcasting using an SFU architecture, enabling seamless movie streaming and discussions.
- Integrated TMDb API to provide real-time movie metadata, including cast, ratings, and reviews.
- Designed an interactive user interface for creating, sharing, and customizing movie lists and helping connect and share views on movies with fellow movie enthusiasts.
- Developed a scalable backend with Node.js, Express.js, PostgreSQL, and Prisma ORM, ensuring efficient data handling and API performance.

Node.js, Express.js, FastAPI, PostgreSQL, Prisma, React.js, Ant Design, Azure, WebSocket, Pandas, NumPy

### Weave

*A collaborative web based environment for managing your projects and streamlining workflow between users and organizations.*

- Designed and implemented a role-based access control system to distinguish permissions for supervisors and group members.
- Integrated real-time notifications for task updates and deadline reminders.
- Developed an project tracking system to monitor project progress.

Role: Backend Developer & Frontend API Integration

- Built and optimized REST APIs for seamless frontend-backend communication.
- Contributed to the frontend and handled API integrations using React, Material-UI, and Ant Design.

Node.js, Express.js, PostgreSQL, Prisma, RestAPI, React, Material-UI, Ant Design

### Voiceops

*Packet Level TCP/UDP for Voice/Audio Chat platform using C++*

- Engineered a low-latency communication protocol using TCP for text transmission and UDP for voice transmission
- Integrated Opus codec for real-time voice compression and RNNoise for noise suppression, ensuring high audio clarity.
- Developed a GTK-based desktop interface for user interactions and chat functionalities.

C++, Opus, RNNoise, GTK, TCP, UDP

## AQI Prediction

A machine learning model to predict air quality index (AQI) in Kathmandu based on meteorological data.

- Collected and preprocessed AQI datasets to train predictive models.
- Conducted a comparative study of four data mining classification algorithms to determine the best performing model
- Implemented logarithmic weighted error calculations to assign higher penalties to extreme misclassifications.

Orange, Pandas, NumPy, Scikit-Learn

## Awards

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### Bhoos Games Scholarship

*Bhoos Games Pvt. Ltd.*

- **Awarded Bhoos Games Scholarship** for academic excellence and innovative 3rd-year project *VoiceOps*.

### Runner Up in LOCUS-Hack a Week

*Ed-Tech Category*

- Developed a web-based project management solution for universities, enhancing collaboration and organization.

### Role of Honour

*Indian Embassy (Golden Jubilee Program)*

- **Awarded Roll of Honour by the Indian Embassy** in recognition of outstanding academic achievement (top CGPA) during undergraduate studies.

## Research

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### Enhancing Mobile Learning Platforms through Meaningful Gamification: Heatmaps, Quizzes, and Time-Based Rewards

*International Journal of Interactive Mobile Technologies*

- Conducted design-based research in Human-Computer Interaction (HCI).
- Developed and analyzed gamified learning mechanisms emphasizing motivation and engagement.

## Certificates

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### Pandas

Kaggle Course

### SQL - HackerRank

A SQL Certificate from hackerrank.

### Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

A non-credit course authorized by Deeplearning, AI and provided by Coursera