Indian Institute of Technology Patna
Dept. of Computer Science & Engineering
Bihta 801106, India
+91 85091 26880
sujitgopal880@gmail.com
https://sujit880.github.io/
sujit880
ORCID: 0000-0002-5170-8098

Sujit Chowdhury

Ph.D. Scholar — IIT Patna

Professional Summary

ML/AI researcher (Ph.D. candidate, IIT Patna) with 5+ years of hands-on experience building and deploying machine learning, deep learning, and large-language-model (LLM) systems at scale. Published in top venues (Knowledge-Based Systems, IEEE TSC, ICONIP, IJCNN) on federated learning, reinforcement learning, and privacy-preserving AI. Skilled in designing end-to-end ML pipelines, from data wrangling and feature engineering through model training, evaluation, and deployment—with strong proficiency in Python, PyTorch, and TensorFlow. Currently exploring LLM fine-tuning with reinforcement learning from human feedback (RLHF) and parameter-efficient methods (LoRA/QLoRA). Proven ability to translate complex research into production-ready solutions; seeking to leverage this expertise as a Data Scientist at Walmart to drive customer-centric, data-driven decision-making at scale.

Key Competencies

Machine Learning	Feature engineering, model development and evaluation, handling imbalanced/noisy data, error analysis
Deep Learning	Training and tuning neural models for vision and sequence data; calibration and robustness evaluation
NLP/LLMs	Prompt design, parameter-efficient fine-tuning (LoRA/QLoRA), retrieval-augmented generation
MLOps	Reproducible training pipelines, model versioning, basic monitoring and deployment workflows

Education

2020–*present* **Ph.D., Computer Science & Engineering**, *Indian Institute of Technology Patna*, Patna, Supervisor: Prof. Raju Halder
Expected 2026 — Institute Fellowship

2018–2020 **M.Tech., Computer Science & Engineering**, *IIEST Shibpur*, Howrah, CGPA: 8.91/10
GATE Scholarship

2011–2015 **B.Tech., Computer Science & Engineering**, *Jalpaiguri Government Engineering College*, Jalpaiguri, 7.84/10

Current Projects

LLM Fine-Tuning with Reinforcement Learning

- Fine-tuning large language models using RLHF and parameter-efficient methods (LoRA/QLoRA) to improve task-specific generation quality and factual grounding.

Blockchain-based Secure Federated Learning Framework

- Building privacy-preserving distributed ML pipelines with blockchain-backed trust and secure aggregation.
- Investigating adversarial robustness of deep-learning models in federated settings; developing RL-driven client selection and adaptive aggregation strategies.

Publications

Journal Articles

2026 **S. Chowdhury** & R. Halder, "Confusion-Calibrated Cross-Entropy and Class-Specialized Aggregation for Robust Federated Learning under Extreme Data Heterogeneity," *Knowledge-Based Systems*, vol. 338, art. 115497, Apr. 2026. DOI: 10.1016/j.knosys.2026.115497.

2024 **S. Chowdhury** & R. Halder, "FedSat: A Statistical Aggregation Approach for Class-Imbalanced Clients in Federated Learning," *arXiv:2407.12345*.

2023 **S. Chowdhury**, A. Mukherjee, R. Halder, "FedRLChain: Secure Federated Deep Reinforcement Learning with Blockchain," *IEEE Transactions on Services Computing*.

2021 G. Yasmin, **S. Chowdhury**, J. Nayak, P. Das, A. K. Das, "Key Moment Extraction for Video Summarization," *Neural Computing and Applications*.

Conference Papers

2023 P. Sahoo, S. Saha, S. Mondal, **S. Chowdhury**, S. Gowda, "Vision Transformer-based Federated Learning for COVID-19 Detection," *ICONIP*.

2022 P. Sahoo, S. Saha, S. Mondal, **S. Chowdhury**, S. Gowda, "Computer-Aided COVID-19 Screening from CT Scan via Fuzzy Ensemble," *IJCNN*.

2022 M. T. Alam, **S. Chowdhury**, R. Halder, A. Maiti, "Blockchain DSLs: Survey, Classification and Comparison," *IEEE Blockchain*.

Teaching Experience

2020–*present* **Teaching Assistant**, *IIT Patna*, Courses: Introduction of Blockchain Technology; Formal Methods for Analysis and verification; Compiler Design; Discrete Mathematics

2018–2020 **Teaching Assistant**, *IIEST Shibpur*, Courses: Foundation of C programming; Operating Systems; Database Systems

Industry Experience

2017–2018 **Software Engineer (ML/CV)**, *Divsoft Solutions Pvt. Ltd.*, Kolkata

Improved human-pose-estimation accuracy using deep-learning models; built a CNN-based boundary-detection system for weigh-bridges, delivering precise truck-weight measurement; optimized real-time inference latency across concurrent dual-camera modules; designed and deployed an end-to-end licence-plate recognition pipeline for large-scale data collection.

Technical Skills

Languages	Python, SQL, C/C++, Bash
ML/DL	PyTorch, TensorFlow
LLM/NLP	LangChain, PEFT (LoRA/QLoRA), RLHF, RAG
Data	Pandas, NumPy, Matplotlib
CV	OpenCV, torchvision, Vision Transformers
Infra/Tools	Git, Docker, Linux, Jupyter, VS Code
Databases	MySQL, Cassandra

Honors & Awards

2020–present Ph.D. Institute Fellowship, Ministry of Human Resource Development, India

2018–2020 GATE Scholarship, Ministry of Human Resource Development, India

Professional Service

Reviewer: IEEE TPAMI, IEEE TNNLS, ICLR

Workshops & Short Courses

IEEE Symposium on 6G Mobile Wireless Communication (2024)

GIAN: Proof & Refinement for Cyber-Physical Systems (2023)

References

- **Prof. Raju Halder**
  Dept. of CSE, IIT Patna, Bihta-801106, Patna, Bihar, India
  Email: halder@iitp.ac.in
  Ph.D. supervisor

- **Prof. Asit Kumar Das**
  Dept. of CST, IIEST Shibpur, Howrah, West Bengal, India
  Email: akdas@cs.iiests.ac.in
  M.Tech. supervisor