

# Swapnaneel Patra

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## EDUCATION

### Indian Institute of Technology Patna (IIT Patna)

Patna, India

*Master of Technology in Artificial Intelligence and Data Science*

Aug. 2025 – Present

### Kalinga Institute of Industrial Technology (KIIT University)

Bhubaneswar, India

*Bachelor of Technology in Computer Science and Engineering*

June 2019 – Aug. 2023

- GPA: 8.38/10.0 (First Class with Distinction).

- Selected coursework: Data Structures and Algorithms, Machine Learning, Artificial Intelligence, High Performance Computing, Database Management Systems, Operating Systems, Computer Networks.

## RESEARCH INTERESTS

Machine learning, deep learning, natural language processing, and computer vision.

Applications of AI in enterprise systems and large-scale distributed computing.

## RESEARCH EXPERIENCE

### Research Intern – Machine Learning for Invoice Prediction

Jan. 2022 – Apr. 2022

*HighRadius Corporation*

Bhubaneswar, India

- Developed machine learning models to predict B2B payment periods for enterprise clients (test accuracy: 90.43%).
- Explored Random Forest, Gradient Boosting, and neural networks for time-series financial data with engineered features from invoice metadata and payment history.
- Documented methodology and results in an internal technical report used for pilot deployment.

## INDUSTRY EXPERIENCE

### Junior Software Engineer

May 2024 – Sep. 2024

*EPAM Systems*

Hyderabad, India

- Worked in an Agile team on a scalable e-commerce web application, including CI/CD pipelines using GitHub Actions and Docker.
- Implemented user authentication and role-based access control (RBAC) using JWT-based authentication and authorization middleware.
- Developed product catalogue features with search and filtering using Elasticsearch.
- Built an admin module for management of users, orders, and product listings.
- Participated in sprint planning, daily stand-ups, and retrospectives.

### Software Engineering Intern

Jan. 2022 – Apr. 2022

*HighRadius Corporation*

Bhubaneswar, India

- Contributed to an AI-powered B2B invoice management system to support payment prediction for enterprise clients.
- Built and trained a machine learning model in Python/scikit-learn (test accuracy: 90.43%) using features such as invoice amount, payment history, and customer credit scores.
- Streamlined backend data retrieval using Java servlets and the MVC design pattern with optimized database queries and caching.
- Implemented a Receivables Dashboard using React and D3.js for interactive visualization of invoice data.
- Developed unit tests with JUnit and participated in integration testing with cross-functional teams.

## OPEN SOURCE CONTRIBUTIONS

### GitLab CLI | Go, CLI Development, REST APIs

Oct. 2025

- Implemented member management and GPG key features (add/remove and add/list/get/delete commands) to enable flexible user access control for GitLab projects.
- Designed command-line interface supporting username or user ID input, configurable access levels (Guest, Reporter, Developer, Maintainer, Owner), and optional expiration dates for temporary access.
- Developed comprehensive unit tests with HTTP mocking for API interactions and edge case coverage (invalid inputs, user not found scenarios).
- Contributed documentation and examples for new commands, improving developer experience for CLI users.
- Merged PRs: #2451 and #2456

**Gemini CLI** | *TypeScript, Node.js, Streaming APIs*

Aug. 2025

- Fixed critical bug in chat-history consolidation to correctly merge multi-part streaming responses, preventing role desynchronization and incorrect text concatenation affecting user conversations.
- Refactored consolidation logic to append new text to the last text part of content blocks rather than the first, improving accuracy of content merging for mixed content types.
- Introduced helper methods (isFirstPartText, isLastPartText) to provide precise checks for content part types, enabling robust merge conditions and preventing incorrect concatenation.
- Added special handling for 'thought' content to filter from permanent history records while yielding immediately in streaming responses for real-time updates.
- Collaborated with maintainers through iterative code review process, addressing feedback and ensuring code quality standards.
- Merged PR: #6235

**BrainGlobe Atlas API** | *Python, Scientific Computing, Brain Atlas Data*

Apr. 2025

- Refactored atlas-generation pipeline to remove implicit BrainGlobe orientation transforms, simplifying atlas creation workflow and improving reproducibility of neuroscience research data.
- Simplified metadata templates by removing orientation field and transform matrix calculations, reducing complexity for atlas maintainers and contributors.
- Implemented ATLAS\_ORIENTATION constant for standardized origin and space definitions across all atlas implementations.
- Added comprehensive tests for metadata generation and atlas consolidation to prevent regressions and ensure data integrity.
- Updated documentation to reflect changes in atlas packaging workflow and orientation requirements for new atlas submissions.
- Merged PR: #555

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**ACADEMIC PROJECTS****AI-Powered B2B Invoice Management System** | *Python, scikit-learn, Flask, React*

Jan. 2022 – Apr. 2022

- Designed and developed an end-to-end machine learning system to predict payment periods for B2B invoices with 90.43% accuracy.
- Implemented feature engineering pipeline to extract relevant features from invoice data, including payment history, invoice amount, customer credit scores, and seasonal patterns.
- Trained and evaluated multiple ML models (Random Forest, Gradient Boosting, Neural Networks) using cross-validation and hyperparameter tuning.
- Developed RESTful API using Flask to serve model predictions and integrate with frontend dashboard.
- Created interactive Receivables Dashboard using React and D3.js for data visualization and business insights.

**Scalable E-commerce Platform** | *Node.js, React, PostgreSQL, Docker*

May 2024 – Sep. 2024

- Architected and implemented a microservices-based e-commerce platform with separate services for authentication, product catalog, orders, and payments.
- Designed database schema for PostgreSQL with optimized indexing strategies for high-performance queries on large product catalogs.
- Implemented secure authentication system with JWT tokens, password hashing using bcrypt, and role-based access control (RBAC).
- Developed CI/CD pipeline using GitHub Actions, Docker, and automated testing to ensure code quality and rapid deployment.
- Implemented caching strategies using Redis to reduce database load and improve response times by 60%.

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**HONORS & AWARDS**

First Class with Distinction, KIIT University, 2023.

Chi Epsilon Honors Society, KIIT University, 2022.

Dean's List, KIIT University, 4 semesters (2019–2023).

Outstanding Achievement, Neural Networks and Deep Learning (DeepLearning.AI), 2023.

Outstanding Achievement, Improving Deep Neural Networks (DeepLearning.AI), 2023.

## PROFESSIONAL DEVELOPMENT

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**Neural Networks and Deep Learning** – Coursera (DeepLearning.AI), Completed 2023

**Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization** – Coursera (DeepLearning.AI), Completed 2023

**Machine Learning Specialization** – Coursera (Stanford Online), In Progress

**Cloud Computing Professional Certificate** – KIIT University, Completed 2023

## TECHNICAL SKILLS

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**Programming Languages:** Python, Go, C/C++, Java, JavaScript, TypeScript, SQL, Bash, HTML/CSS

**Machine Learning & AI:** PyTorch, TensorFlow, scikit-learn, Keras, pandas, NumPy, SciPy, Matplotlib, Seaborn

**Web Development Frameworks:** React, Next.js, Node.js, Express.js, FastAPI, Flask

**Database Systems:** PostgreSQL, MySQL, MongoDB, Redis, Elasticsearch

**DevOps & Cloud:** Docker, Kubernetes, Git, GitHub Actions, GitLab CI, TravisCI, CircleCI, Google Cloud Platform, AWS

**Developer Tools:** VS Code, IntelliJ IDEA, PyCharm, Jupyter Notebook, Postman, Linux/Unix

**Software Engineering:** REST APIs, Microservices Architecture, CI/CD, Unit Testing (pytest, JUnit), Integration Testing, Agile/Scrum, Design Patterns, MVC Architecture

**Other Technologies:** D3.js, OpenCV, NLTK, spaCy, Kafka, RabbitMQ, NGINX

## RELEVANT COURSEWORK

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**Graduate Level:** Advanced Machine Learning, Statistical Learning Theory, Neural Networks and Deep Learning, Data Mining and Analytics, Natural Language Processing, Computer Vision

**Undergraduate Level:** Data Structures and Algorithms, Design and Analysis of Algorithms, Machine Learning, Artificial Intelligence, High Performance Computing, Data Analytics, Probability and Statistics, Database Management Systems, Operating Systems, Computer Networks, Software Engineering, Cloud Computing, Compiler Design, Automata and Formal Languages, Object Oriented Programming, Digital Electronics, Engineering Economics

## SERVICE & LEADERSHIP

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**Open Source Contributor** – Active contributor to GitLab CLI, Gemini CLI, and BrainGlobe Atlas API projects (2024-2025)

**Technical Community Engagement** – Participated in code reviews and discussions on open-source projects, contributing to collaborative development practices

**Knowledge Sharing** – Authored technical documentation and examples to help developers understand complex features and APIs

**Agile Team Collaboration** – Active participant in sprint planning, retrospectives, and continuous improvement initiatives at EPAM Systems

## REFERENCES

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Available upon request.