

Neelam Mahapatro

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EDUCATION

International Institute of Information Technology, Bangalore <i>PG Certificate Programme in Machine Learning and AI, GPA 3.58/4</i>	Oct 2022 – Dec 2023 <i>Online</i>
National Institute of Technology, Rourkela <i>B.Tech. in Computer Science and Engineering, GPA 9.00/10</i>	July 2016 – May 2020 <i>Rourkela, India</i>

RESEARCH EXPERIENCE

Filtered DiskANN <i>Software Engineer, Microsoft, Advisor - Dr. Ravishankar Krishnaswamy</i>	June 2022 – Present <i>Bangalore, India</i>
<ul style="list-style-type: none">Collaborated with Microsoft research team to develop filter-based indexing and retrieval algorithm for billion-scale Ads database, incorporating custom filters across countries, brands, and languages. [Project]Evaluated performance metrics for a new filter-based algorithm against standard DiskANN on the Microsoft Advertisers corpus, analyzing index build time, search latency, and recall rates.Developed a novel vector caching optimization strategy for SSD-based indices reducing search latency by 30%.Engineered data generation pipelines in Azure to create filtered DiskANN indices, implementing delta analysis infrastructure for production deployments across Europe (90+ countries) and Asia-Pacific regions.	
Smart Wireless Applications and Networking (SWAN) Lab <i>Computer Networks Researcher, IIT Kharagpur, Advisor - Prof. Sudip Mishra</i>	Dec. 2018 – Jan 2019 <i>Kharagpur, India</i>
<ul style="list-style-type: none">Developed encryption algorithms for fingerprint data and utilized it for authentication. [Project]Designed back-end infrastructure for collecting and processing vital sensor data for patient health monitoring.Implemented MQTT protocol to enable reliable data transfer between health sensors and AWS servers.	
Computer Networking Lab <i>Undergraduate Researcher, NIT Rourkela, Advisor - Prof. Suchismita Chinara</i>	June 2019 – Jan 2020 <i>Rourkela, India</i>
<ul style="list-style-type: none">Developed secure web interfaces for doctors to monitor patient health data. [Project]Implemented WebSocket protocol for live data streaming between sensors and IoT dashboards.Developed real-time alert system analyzing 2-min sensor data window to notify doctors of critical patient vitals.	

SELECTED PUBLICATIONS

- [1] Gollapudi, Siddharth and Karia, Neel and Sivashankar, Varun and Krishnaswamy, Ravishankar and Begwani, Nikit and Raz, Swapnil and Lin, Yiyong and Zhang, Yin and **Mahapatro, Neelam** and Srinivasan, Premkumar. “Filtered-diskann: Graph algorithms for approximate nearest neighbor search with filters” In Proceedings of the ACM Web Conference 2023 (pp. 3406-3416) [\[Paper\]](#)
- [2] Rath, Prabin Kumar and **Mahapatro, Neelam** and Sahoo, Subham and Chinara, Suchismita “Design and performance analysis of an IoT based health monitoring system for hospital management.” in International Conference on Computing, Communication, and Intelligent Systems (ICCCIS) 2021. [\[Paper\]](#)
- [3] Rath, Prabin Kumar and **Mahapatro, Neelam** and Nath, Prasanmit and Dash, Ratnakar. “Autonomous chess playing robot.” in 2019 28th IEEE international conference on robot and human interactive communication (RO-MAN). [\[Paper\]](#)

PROJECTS

Melanoma Skin Cancer Prediction [Project]	Spring 2023
<ul style="list-style-type: none">Preprocessed patient skin images, developed visualization tools for pattern analysis, and ensured correct data annotation for model training.Implemented a Convolutional Neural Network (CNN) model for automated melanoma detection, achieving 72% accuracy in identifying early-stage skin cancer.	

Technical Festival Portal - Innovision [\[Webpage\]](#)

Fall 2019

- Developed online registration and management portal for NIT Rourkela's annual techno-management festival.
- Created interactive user interfaces using React for administrators, event organizers, and participants, handling **1200+** student registrations in **34** different events.

Chess Playing Robot [\[Project\]](#)

Spring 2019

- Developed an interactive user interface for human-robot chess interaction with active score tracking.
- Designed validation scripts for identifying correct chess moves enhancing the accuracy and dynamic monitoring of chess game interactions.

Room Automation [\[Project\]](#)

Fall 2018

- Engineered RESTful APIs to enable live switching and status updates for home electrical appliances, enhancing IoT device management capabilities.
- Built secure web dashboard for household members to monitor real-time as well as historical surveillance data.

INDUSTRY EXPERIENCE

Microsoft

June 2022 – Present

Software Engineer

Bangalore, India

- Designed and implemented an end-to-end workflow for extracting relevant phrases from user queries to generate targeted advertisements, deploying the system across global data centers.
- Architected scalable infrastructure to serve global dataset indices of **700 Million** advertisements, implementing automated validation and deployment pipelines to enhance system reliability and performance.
- Spearheaded cross-team collaboration to productionize the filtered DiskANN algorithm, optimizing advertisement targeting and increasing revenue by **8%**.
- Engineered automated validation of ML model configurations through shell scripts and enhanced Azure DevOps pipeline security with comprehensive code scanning measures.

SAP Labs

Aug. 2020 – July 2022

Software Engineer

Hyderabad, India

- Contributed to the development and maintenance of front-end applications for Queensland State Government tax portal with **85,000+** active users.
- Developed tax form templates using SAP OData to bind multiple revenue categories, including payroll, royalty, and betting systems, tailored to Australian government regulatory requirements.
- Integrated SAP CPI technology to process new user registrations, verify documents, and notify officials for approval before confirming valid citizenship.

SKILLS AND INTERESTS

Interests: Large Scale Information Retrieval, IoT, Machine Learning and AI

Programming Languages: C/C++, Python, C#, Javascript, Java, Shell

Cloud Technologies: Azure, SAP Cloud, Kubernetes, Docker

Tools and Frameworks: NodeJS, SAPUI5, HTML, Bootstrap, PyTorch, TensorFlow, Linux, Git

ACHIEVEMENTS

- Recipient of **Best Performer Award 2023** for the Filtered DiskANN project at Microsoft, Bangalore.
- Received India's top 10 innovative project award for Chess Playing Robot at **Quest Ingenium 2018**, Bangalore.
- Secured 2nd position among **200,000** students in the CHSE board intermediate examination, receiving full scholarship for bachelor's education from the Government of Odisha.

EXTRACURRICULAR ACTIVITIES

- Managed registration and logistics for **6,000+** participants at NIT Rourkela's annual techno-management festival.
- Organized an online tech-hunt event at NIT Rourkela with **700+** participants, managing the distribution of coupons, goodies, and monetary awards.
- Volunteered for student counseling programs to help freshman students adapt to the new college environment and transition to university life.

REFERENCES

- Dr. Ravishankar Krishnaswamy**, Microsoft (Microsoft Research Advisor) [rakri@microsoft.com]
Dr. Amit Singh, Ads Lead, Microsoft (Microsoft Research Advisor) [siamit@microsoft.com]
Dr. Karthik Sankaranarayanan, Microsoft (Microsoft Research Advisor) [karthiksa@microsoft.com]
Prof. Suchismita Chinara, NIT-Rourkela (Bachelor's Thesis Advisor) [suchismita@nitrkl.ac.in]