Ramanarayan Ransingh

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Date of Birth: March 10, 2004 (21 years old)
Gender: Male
Nationality: Indian
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Links: LinkedIn | GitHub | Portfolio
Languages: English (Fluent), Hindi (Native), Odia (Native), Japanese (Elementary knowledge)

Research Interests

I am specializing in multi-agent LLM frameworks and architectures with state persistence capabilities. My research explores the development of autonomous AI systems using LangGraph, LangChain, and retrieval-augmented generation (RAG) for complex problem-solving. I focus on creating privacy-preserving conversational systems that maintain data sovereignty while leveraging generative AI. At a Japanese university, I aim to advance computer vision integration with multi-agent frameworks for comprehensive AI solutions that bridge cultural and linguistic gaps in human-AI interactions.

Education

ITER, Siksha 'O' Anusandhan University — **Bhubaneswar, India**
Bachelor of Technology, Computer Science & Engineering — *2021 – 2025*

- CGPA: 9.23/10
- Coursework: Data Structures & Algorithms, Software Engineering, Machine Learning, Deep Learning, Database Systems, Computer Vision, Natural Language Processing, Operating Systems

Jupiter Science Higher Secondary School — **Bhubaneswar, India**
Higher Secondary Education (12th), Science — *2019 – 2021*

- Percentage: 92% (CHSE)

Saraswati Vidyamandir — **Nayagarh, India**
Secondary Education (10th) — *2017 – 2019*

- Percentage: 88.16% (BSE)

Research & Publications

Advanced Customer Service System (Thesis) — **July 2025**
Ramanarayan Ransingh, Supervised by Prof. Sunil Samanta Singhar — *Dept. of CSE, SOA University*

- Pioneering a privacy-preserving customer service system that runs models locally to prevent sensitive data leakage
- Implementing innovative hybrid vector embedding techniques that improve retrieval accuracy by 87% while maintaining data sovereignty
- Developing a framework for real-time adaptation to dynamic content changes that enhances user engagement by 65%

IntegraMind: A Framework for Unified Assessment and Intervention in Dual Diagnosis — **May 2025**
Arun Agarwal, Ramanarayan Ransingh (Under Review - IEEE Intelligent Systems) — *[Preprint]*

- Created a graph-based chatbot framework addressing co-occurring mental health and substance use disorders
- Designed a multiagent architecture with LangGraph where specialized agents handle distinct conversation aspects
- Integrated validated screening tools, Retrieval-Augmented Generation (RAG), and human-in-the-loop protocols

StatefulFlora: A LangGraph Architecture for Secure Conversational Commerce — **April 2025**
Arun Agarwal, Ramanarayan Ransingh (Under Review - IEEE Intelligent Systems) — *[Preprint]*

- Developed a novel conversational AI agent for floral retail using a stateful architecture built on LangGraph
- Implemented three key innovations: cyclic state machine with SQLite persistence, hybrid tool routing system, and real-time vector embedding synchronization protocol
- Demonstrated significant improvements in order completion rates and reduction in unauthorized transactions

Research Experience

Undergraduate Research Assistant — **Bhubaneswar, India**

Siksha 'O' Anusandhan University, under Dr. Arun Agarwal — *Oct 2024 – Present*

- Leading research on innovative AI agent architectures for conversational systems with state persistence
- Developing and implementing graph-based frameworks for complex dialogue management in mental health applications
- Collaborating on multiple research papers focused on LLM applications in healthcare and e-commerce
- Advisor: Dr. Arun Agarwal, Associate Professor, Department of ECE

Industry Experience

Machine Learning Engineer Intern — **Bhubaneswar, India**

Mindfire Solutions — *Jan 2025 – Mar 2025*

- Designed a scalable RAG system with FastAPI and LangChain processing 100+ documents daily with 95% accuracy
- Built AI agents with LangGraph implementing state persistence for enhanced conversational capabilities
- Implemented secure backend architecture with JWT authentication and role-based access control
- Optimized database queries and vector search algorithms, achieving 40% faster response times
- Received Letter of Recommendation from Mr. Sai Pattnaik, Manager, Machine Learning Engineering Team

AI/ML Research Trainee — **Bhubaneswar, India**

Mahindra COMVIVA — *Jul 2024 – Sep 2024*

- Engineered CandidateCast, an ML-powered application predicting candidate joining probability with 85% accuracy
- Built data processing pipelines handling 1,000+ candidate profiles, with robust error handling
- Created interactive Power BI dashboards visualizing business insights, enabling data-driven decision making

Technical Projects

NihonGO: Japanese Language Learning Multi-Agent System [Link]

- Developed a comprehensive Japanese language learning platform using a multi-agent architecture based on LangGraph
- Implemented specialized agents for grammar instruction, vocabulary acquisition, and cultural context with state persistence
- Created a RAG system with vector embeddings for dynamic retrieval of language learning materials from diverse sources
- Built an interactive kana practice module with handwriting recognition using TensorFlow and FastAPI backend
- Technologies: Python, LangGraph, LangChain, FastAPI, RAG, ChromaDB, TensorFlow, React

Japanese License Plate Recognition System [Link]

- Engineered a computer vision system for automatic recognition of Japanese license plates using PyTorch and YOLOv8
- Designed and trained specialized CNN models for recognizing region names, classification numbers, kana characters, and designation numbers
- Achieved high accuracy across all model components (97.6-99.8%) using optimized neural network architectures
- Deployed the system as a web application using Hugging Face Spaces for real-time license plate detection and recognition
- Technologies: Python, PyTorch, YOLOv8, OpenCV, Hugging Face, Gradio

ResumeIQ: Personalized Job Application Assistant [Link]

- Created a streamlined application to match resumes with job descriptions and generate tailored cover letters
- Engineered a semantic matching algorithm that identifies key skills and experience gaps
- Integrated with Gmail API for secure document sharing and automated application tracking
- Technologies: Python, Streamlit, Hugging Face Transformers, Google Cloud APIs

Skills & Tools

Programming Languages: Python (Advanced), Java, C/C++, SQL, LaTeX
AI/ML Technologies: LangChain, LangGraph, RAG, NLP, LLMs, Hugging Face, OpenAI, Google Gemini, Computer Vision, Deep Learning
Machine Learning Frameworks: PyTorch, TensorFlow, Keras, Scikit-learn, XGBoost
Tools: FastAPI, Docker, Git, Streamlit, Pandas, NumPy, OpenCV
Data Storage: PostgreSQL, MySQL, SQLite, ChromaDB, Qdrant, FAISS

Academic Achievements & Certifications

Advanced AI/ML Engineering Certification — **Oct 2024**
Mahindra COMVIVA — *[Certificate]*

AWS Educate Introduction to Generative AI — **Sep 2024**
Amazon Web Services — *[Certificate]*

Oracle MySQL Database Administrator Certification — **Aug 2024**
Oracle — *[Certificate]*

Microsoft Career Essentials in Generative AI — **Jun 2024**
Microsoft — *[Certificate]*

Activities & Leadership

Technical Lead — **AI/ML Student Community**
Siksha 'O' Anusandhan University — *Mar 2024 – Present*

- Organize weekly workshops on AI/ML technologies, benefiting 80+ students
- Lead a team of 5 student volunteers in organizing technical events and hackathons
- Created and maintained resource repository for AI learning materials used by 100+ students

Coordinator — **ITER Robotics Club**
Siksha 'O' Anusandhan University — *Oct 2023 – Present*

- Coordinate weekly club activities and manage a team of 8 members working on various robotics projects
- Won third place in the inter-college robotics competition at NIT Rourkela Tech Fest 2024
- Collaborated with faculty advisors to secure funding for new equipment and competition registrations

Workshop Organizer — **Bhubaneswar, India**
Exploring and Understanding Data Workshop — *May 2023*

- Organized and conducted a data science workshop attended by 50+ students
- Prepared hands-on materials on data preprocessing and exploratory data analysis

References

Dr. Arun Agarwal — **Siksha 'O' Anusandhan University**
Associate Professor, Department of ECE — *arunagrawal@soa.ac.in*

Dr. Debahuti Mishra — **Siksha 'O' Anusandhan University**
Professor, Head of the Department of Computer Science and Engineering — *debahutimishra@soa.ac.in*

Mr. Sai Pattnaik — **Mindfire Solutions**
Manager, Machine Learning Engineering Team — *Letter of Recommendation Available*