

RUPSA BANERJEE

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[No visa sponsorship needed](#)

Results-driven AI Consultant with 3+ years of experience designing and deploying machine learning and deep learning solutions that enhance efficiency and drive business growth. Expert in Python, TensorFlow, cloud platforms, and real-time agent-based systems for speech, intent, and context modeling. Proven track record in applying advanced AI techniques to improve model accuracy by up to 30% and streamline operations by 50%.

SKILLS

- **Programming & Data Tools:** Python, SQL, Git, Jira, Tableau, Matplotlib, Windows, Linux
- **Generative AI & LLMs:** GPT, BERT, Claude, Hugging Face, Prompt Engineering, RAG, Vector DB
- **Big Data & Cloud PLaforms:** Hadoop, Spark, MongoDB, AWS, Azure
- **Web & API Development:** FastAPI, RESTful API, WebSocket, Django, Javascript, HTML/CSS, React, WebRTC
- **Machine Learning & AI:** TensorFlow, PyTorch, Scikit-learn, Hugging Face, NLP, Computer Vision, Reinforcement Learning, Model Deployment and Productionization.
- **MLOPs & Engineering:** CI/CD Pipelines, Docker, ETL/ELT Pipelines, Data Modeling, Data Warehousing, Workflow Orchestration, SaaS Architecture
- **Soft Skills:** Effective communication, Cross-functional Collaboration, Ethical Leadership, Adaptability

EDUCATION

Master of Science in Data Science

Jan, 2022 – July, 2024

New Jersey Institute of Technology

GPA: 3.67 / 4.0

[Relevant Courses:](#) Machine Learning, Deep Learning, Artificial Intelligence, DBMS, Data Structure Algorithm, Data Analytics, Applied Statistics,

Big Data, Application of Parallel Computing, Web System Development.

Bachelor's in Engineering

June, 2014 – May, 2017

Techno India College of Technology

GPA: 3.74 / 4.0

[Key Academic Focus:](#) Engineering Math, Business Economics & Accounting, Computer Applications and Programming, Principle of Management,

Costing, Contract & Valuation, Industrial Management

Diploma in Engineering

Jun, 2011 – May, 2014

West Bengal Survey Institute

1st Class Distinction

WORK EXPERIENCES

Independent AI Consultant

Feb, 2025 - Present

[New Jersey](#)

[Supervisor: Dr. Pantelis Monogioudis; Dept. of Data Science \(New Jersey Institute of Technology\)](#)

Built a real-time, production-grade Conversational AI Platform using an agentic AI approach with multi-agent intent handling, RAG-enhanced memory (MCP), and end-to-end speech interaction. Integrated WhisperLive STT with CUDA for low-latency transcription and HuggingFace Kokoro-82M for phoneme-level, multi-speaker TTS with sub-300ms latency. Fine-tuned Sesame CSM with LoRA for semantic and acoustic token modeling. Achieved scalable, GPU-accelerated deployment using FastAPI, async WebSockets, Docker, UV, and NiceGUI, delivering responsive, agent-driven voice assistants optimized for cognitive health and real-time communication use cases.

Machine Learning Researcher

Jan, 2024 – Jan, 2025

[New Jersey Institute of Technology](#)

[Supervisor: Dr. Mengjia Xu; Dept. of Data Science \(New Jersey Institute of Technology\)](#)

[Advisor: Dimitrios Pantazis; Director of MEG Core Neuroimaging \(Massachusetts Institute of Technology\)](#)

Developed a TransformerG2G-based framework for analyzing dynamic brain connectivity using MRI data, in collaboration with teams from [MIT](#) and [Oxford](#). Leveraged self-attention mechanisms and uncertainty modeling to improve link prediction accuracy (novelty score: 0.6), achieving significant gains in MAP and MRR. The model effectively captured temporal brain dynamics, enabling early diagnosis of neurological disorders and contributing to impactful public health outcomes.

Search Engine Optimization Data Analyst

Jan, 2018 – May, 2020

[Irvine Infocom Pvt. Ltd. | India](#)

Optimized large-scale ETL pipelines across AWS, Azure, and GCP to process data from Google Search Console and SEMrush. Applied machine learning techniques for keyword ranking, content clustering, and backlink strategy, resulting in improved search visibility and automated SEO workflows. Utilized Tableau and Excel for advanced data visualization, combined with statistical analysis and Git-based version control to deliver data-driven insights and enhance content performance.

Freelancing | Data driven Web Optimization Analyst

June, 2020 – Dec, 2021

Enhanced Web Optimization through freelancing and online collaborations, implementing data-driven strategies for website visibility, keyword optimization, and digital marketing.

For a detailed list of projects, please visit my [GitHub Profile](#).