RUDRAMANI SINGHA

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EDUCATION

Columbia University Aug 2022 - Feb 2024
Master of Science in Biomedical Engineering New York, USA

Awards: Shardashish Interschool Fellow (1 of 500), Data Science Institute Scholar
Key Courses: High-Performance ML, Competitive Programming, Bayesian Inference

University of Mumbai Jun 2018 - Jul 2022
Bachelor of Engineering in Information Technology Mumbai, India

Key Courses: Distributed Systems, Computer Networks, Operating Systems, System Administration, Data Science

EXPERIENCE

Columbia University, School of Engineering and Applied Science Aug 2024 - Present
Research Analyst, under Prof. Nuttida R New York, USA

- Leading projects to decode latent perceptual decision-making with interpretable ML models for U.S. Air Force.
- Developed scalable multi-agent reinforcement learning frameworks in JAX, extending DeepMind's RLax and OpenAI Gym with joint agents and environment to simulate emergent brain dynamics.
- Designed, deployed, and managed a private high-performance GPU cluster (12 ADA RTX 6000 and 26 RTX 4000 GPUs) supporting continuous research computation.

WeEvolve Cognitech Inc. May 2024 - Aug 2024
ML Engineering Intern New York, USA

- Developed a scalable healthcare platform with Django to centralize patient data and power predictive care across clinics.
- Integrated LLMs (e.g., GPT-style models) into a conversational interface for scheduling, data retrieval, and health goal tracking, reducing manual scheduling tasks by 60%.
- Applied retrieval-augmented generation (RAG) to extract tailored insights from medical histories, improving clinical decisions and patient engagement.

Kriash Corp. Feb 2024 - May 2024
Software Engineering Intern New York, USA

- Built neonatal monitoring platform with ML models deployed on low-power microcontrollers for real-time anomaly detection.
- Processed multimodal vital signs (e.g., temperature, heart rate, SpO2, humidity) to trigger alerts in clinical settings.
- Developed HIPAA-compliant REST APIs for seamless data integration with existing medical systems.

Columbia University, Department of Statistics Aug 2023 - Feb 2024
Research Assistant, under Prof. Liam Paninski New York, USA

- Analyzed latent cognitive states in mice using advanced computer vision pipelines and body landmark tracking.
- Developed semi-supervised contrastive temporal smoothing models to enhance prediction accuracy in behavioral research.
- Deployed toolkits to measure representational similarities in the brain, used by the International Brain Laboratories.

SKILLS

Tools: PyTorch, JAX, TensorFlow, Keras, PyMC, Scikit-learn, Spark, Elasticsearch, Pandas, Git, Flask, Django, Docker, AWS, GCP
Languages: Python, R, C/C++, Java, CUDA, STAN, MATLAB, SQL, JavaScript, LaTeX
ML Pipelines: Retriever-Reader, Object Detection, Image Segmentation, Abstractive Summarization, Question Answering (IRQA)
Certifications: Reinforcement Learning, Amazon Web Services, TensorFlow in Google Cloud Platform, Big Data (UCSD)

PUBLICATIONS

- **R. G. Singha**, *et al.* "Probing adaptive decision-making under uncertainty using extended Hidden Markov Models." Poster presented at *Columbia AI Summit*, New York, NY, Mar 2025. [link]
- **R. G. Singha**, *et al.* "Decoding latent decision subspaces through Hidden Markov Models." Poster presented at *Air Force Center of Excellence in the Neuroscience of Decision-Making (NeuroCoE) Annual Meeting*, New York, NY, Sep 2024. [link]
- **R. G. Singha** *et al.* "Dynamic Pose Diagnosis with BlazePose and LSTM for Spinal Dysfunction Risk Estimation," *2022 4th International Conference on Smart Systems and Inventive Technology (ICSSIT)*, Tirunelveli, India, 2022, pp. 1547-1552, doi: 10.1109/ICSSIT53264.2022.9716509. [link]
- **R. G. Singha** *et al.* "Vehicle Speed Detection Using Multi-Branch Networks From Temporal Image Pairs," *2022 4th International Conference on Smart Systems and Inventive Technology (ICSSIT)*, Tirunelveli, India, 2022, pp. 301-308, doi: 10.1109/ICSSIT53264.2022.9716386. [link]