Kunal Rathore

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SUMMARY

Scientific Machine Learning Researcher with 5+ years of experience developing hybrid AI models for complex scientific systems. PhD candidate in Environmental Sciences & AI with proven expertise in explainable AI, time-series forecasting, and interdisciplinary modeling. Published researcher with strong background in statistical modeling, neural networks, and data-driven scientific discovery. Demonstrated ability to bridge computational methods with real-world scientific applications.

EXPERIENCE

Oregon State University **Corvallis, OR, USA**

Graduate Research Assistant *Jan 2022 - Present*

- Hybrid-ML Modeling for Harmful Algal Blooms: Developing innovative hybrid models combining watershed modeling, hydrological monitoring, and machine learning for HAB prediction with enhanced forecasting accuracy
- Scientific Machine Learning in Ecology: Creating data-driven equations and neural networks for critical transition prediction in socio-economic ecological models, advancing understanding of complex system dynamics
- Explainable AI Methods: Pioneering post-hoc explanation methods for vision-based deep learning models using correspondence algorithms, significantly enhancing model interpretability and transparency
- Led cross-functional collaborations delivering data-driven recommendations for environmental policies and business frameworks.

Seagate Technology LLC **Corvallis, OR, USA**

AI / ML Intern *Jul 2023 - Sep 2023*

- Spearheaded enterprise integration of Generative AI and LLMs, achieving 35% reduction in query times and substantial user efficiency gains
- Engineered scalable data pipelines for financial data accessibility with 20% efficiency improvement
- Coordinated cross-functional design sprints for scalable AI-driven workflows aligned with enterprise scientific computing requirements

Persistent Systems **Pune, MH, India**

Senior Software Engineer *Jul 2019 - Dec 2021*

- Developed advanced time-series forecasting models for anomaly detection in global enterprise network security systems
- Designed sophisticated link extraction models for market sentiment analysis, driving 30% enhancement in real-time decision-making capabilities
- Created automated text summarization platform, expediting market trend assessments by 40%

Persistent Systems **Pune, MH, India**

ML Intern *Jan 2019 - Jul 2019*

- Built organizational analytics tools reducing HR data analysis time by 40% through advanced statistical modeling
- Conducted research on organizational network analytics providing actionable insights into complex interaction patterns
- Enhanced chatbot frameworks using human feedback learning, achieving 25% improvement in response accuracy
- Developed explainable AI frameworks for deep learning models in healthcare applications

EDUCATION

Oregon State University **Jan 2022 - Dec 2025**
PhD, Environmental Sciences & Artificial Intelligence
- Dissertation Focus: Hybrid modeling, predictive analytics, and AI-driven decision systems for environmental applications
- Research Areas: Scientific machine learning, explainable AI, critical transition prediction in ecological systems

Savitribai Phule Pune University **Jul 2017 - May 2019**
Master's, Applied Mathematics
- Specialization: Computational mathematics, numerical optimization, and machine learning algorithms
- Thesis: Interpretable methods for Deep Learning models

Savitribai Phule Pune University **Jul 2013 - May 2017**
Bachelor's, Mechanical Engineering

TECHNICAL EXPERTISE

Scientific Computing: Python, R language, MATLAB, Julia, Tensorflow, Natural Language Processsing (NLP), PyTorch, Machine Learning, Software Engineering, High Performance Computing (HPC)
Visualization & Communication: Tableau, PowerBI, Matplotlib, Seaborn, Excel, Technical writing
Cloud & Infrastructure: AWS, Microsoft Azure, End-to-End, Apache Airflow, Flask, SQL, APi development
Data Science & Analytics: Statistical modeling, Anomaly detection, Timeseries analysis, Parameter Optimization, Correlation analysis, Handling missing data, Scikit-learn, Pandas, NumPy, SciPy, Jupyter Notebook
Scientific ML Frameworks: Hybrid modeling, Physics-informed neural networks, Amplitude, NeuralODE

PUBLICATIONS

- **Generating Part-Based Global Explanations Via Correspondence**, IJCAI 2024 Workshop on Explainable Artificial Intelligence (XAI) Kunal Rathore, Prasad Tadepalli
- **Simple Method of Solution for Multi-label Feature Selection**, 2019 IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT). Jayaraman K Valadi; Prasad T Ovhal; Kunal J Rathore
- **RA2Vec: Distributed Representation of Protein Sequences with Reduced Alphabet Embedding**, ACM Conference on Bioinformatics 2020. Rajitha Yasas Wijesekara, Ashwin Lahorkar, Kunal Rathore, Jayaraman Valadi

CERTIFICATIONS

- AWS Cloud Practitioner,
- AgAID Digital AgAth0n 2023 - Participant,
- Responsible AI Algorithms Design,
- AI for Marketing,

CORE COMPETENCIES

- **Research Skills:** Experimental design, hypothesis testing, interdisciplinary collaboration, grant writing preparation
- **Technical Leadership:** Cross-functional team coordination, mentoring junior researchers, project management
- **Communication:** Scientific writing, conference presentations, stakeholder engagement, complex concept explanation
- **Problem-Solving:** Analytical thinking, innovative solution development, data-driven decision making