

# Rithesh Kumar

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## SUMMARY

I am an AI enthusiast, pursuing my MS in Computer Science at UCSC with a particular focus on NeuroSymbolic Generative AI and Natural Language Processing. I have extensive experience in developing, deploying, and optimizing models across various domains, including finance, social media analysis, and healthcare. Highly passionate for unlocking the potential of AI through cutting-edge research.

## EXPERIENCE

### Decision Scientist - Goldman Sachs

08/2020 - 07/2023, Bangalore, India

- Developed 2 models based on SVM and time-series regression for customer delinquency and risk scoring for personal loans and further assisted in its deployment. The addition of the new models resulted in a 6% decrease in the overall delinquency rate and an increase in customer satisfaction by 8%
- Spearheaded the research on changing market conditions during the COVID period by leveraging the tools of LSTM-based time series analysis over the years. The findings of the study were then used to refine the existing policies, leading to an increase in new customers by 10%
- Supervised a team in building a comprehensive end-to-end pipeline for the credit decision and loan offer process on Provenir, leading to a decrease in the latency of loan processing by 15%, an increase in load handling by 13% and reducing the cost of maintenance of the pipeline by 20% compared to the previous pipeline deployed on a legacy platform, FICO.

### Machine Learning Research Intern - Sprinklr India

05/2019 - 07/2019, Gurgaon, India

- Developed and deployed a LSTM model for sentiment analysis of customer reviews on targeted products. Additionally, assisted in the development of the Twitter spam classifier model, reducing the errors by 10% compared to the previous spam classifier and significantly improving data quality for sentiment analysis.
- Conducted research on model compression for LSTMs, proposing a teacher-student model that achieved a 60% size reduction with minimal loss of accuracy.

## SKILLS

**Areas of Expertise:** Generative AI, Artificial Intelligence, Natural Language Processing, Computer Vision, Reinforcement Learning, Deep Learning, Model Optimization, Image Processing, AI Model Deployment, Machine Learning Model Evaluation, Data Mining and Visualisation, Pattern Recognition.

**Languages:** Python, R, C, C++, Javascript, SQL.

**Tools:** TensorFlow, Keras, PyTorch, spaCy, Scikit Learn, openCV, Pandas, Numpy, Scipy, MySQL, MongoDB, Spark, Git.

## EDUCATION

### Master of Science in Computer Science • University of California Santa Cruz

Santa Cruz, CA • 09/2023 - 05/2025 • 4/4 GPA

- [Teaching Assistant](#) for Computer Architecture. 01/2024 - 03/2024
- [Teaching Assistant](#) for Ethics and Algorithms. 04/2024 - Present

### Bachelor of Technology in Computer Science • National Institute of Technology Karnataka

Surathkal, India • 08/2016 - 05/2020 • 9.39/10 GPA

## PUBLICATIONS

### Prostate Cancer Grading using Multistage Deep Neural Networks • [Publication](#)

MIND 2021 • 07/2021 - 12/2021 • Springer

- Developed a novel multi-stage deep learning framework for automated Gleason system grading (GSG) and grade group (GG) classification of prostate cancer cells. This approach differs from existing methods by treating Gleason pattern (GP) classification as a classification problem combined with segmentation.
- Achieved an overall diagnostic accuracy exceeding 90% f1-score for each CNN, demonstrating its effectiveness in GSG and GG classification. Additionally, the precision and recall values for each GP both exceeds 90%, beating the state-of-the-art techniques.

### Network Anomaly Detection using Artificial Neural Networks Optimised with PSO-DE Hybrid • [Publication](#)

SSCC 2018 • 01/2018 - 05/2018 • Springer

- Proposed a hybrid PSO-DE algorithm combining Particle Swarm Optimization and Differential Evolution to optimize ANNs for network anomaly detection. The hybrid PSO-DE algorithm leverages the complementary advantages of both techniques to achieve better exploration and exploitation capabilities.
- The optimized ANNs significantly improved anomaly detection accuracy compared to traditional methods. Obtained an accuracy of 98.7%, substantially improving the accuracy of conventional ANN-based methods.

## PROJECTS

### Analysis of Neuro-Symbolic AI for Cognitive, Linguistic, and Philosophical Applications

04/2024 - Present

- Conducting a comparative study on Neuro-Symbolic Knowledge Distillation, Neuro-Symbolic Commonsense Reasoning and Cognitive Architecture, identifying the common ground and addressing their shortcomings with each other's help.
- Proposed a novel architecture combining the concepts of the above three research fields for Situated Reasoning about norms, intents, and actions. The goal is to utilize the power of Neuro-Symbolic AI to enhance linguistic abilities of current LLM models.

### Whispers of the Heart - Sentiment Analysis of Journal for Therapeutic Assistance • [Project](#)

04/2024 - 05/2024

- Developed the Whispers of the Heart, a daily journaling app that encourages people to journal their thoughts and emotions along with sharing various artforms (quotes, poetry, paintings, or songs) that they relate to.
- Trained and fine-tuned the Gemini 1.5 Pro multimodal model to analyze the journal entries for the sentiment of the person. The analysis will then be shared with the therapist for a daily insight into the person's mind. Ensured the journal's privacy from the therapist while providing insightful information on the emotions.
- Integrated explainability in the model to articulate its reasoning process, breaking down its interpretation step by step.

### Academic Video Summarizer and Enhancer using Retrieval Augmented Generation with LLMs • [Project](#)

01/2024 - 03/2024

- Developed a novel LLM-based pipeline for generating informative video summaries. This approach leverages Retrieval Augmented Generation (RAG) to incorporate external knowledge from reading materials, resulting in more comprehensive and student-friendly summaries than traditional methods.
- Implemented few-shot learning and prompt-based fine-tuning to enhance the performance of pre-trained LLMs. This strategy addresses the limitations of pre-trained models and significantly improves the quality and accuracy of the generated video summaries.
- Undertook a user survey to evaluate the performance of the model. Obtained a 65% - 35% preference ratio between the summary generated by our model versus that of the existing state-of-the-art summarisers.

## HOBBIES

Blogging - [Machine Learning series](#)

Writing - [Quotes](#)

[Baking and Crochet](#)