

Balaji R — Curriculum Vitae

Indian Institute Of Science – Bangalore - 560012 – India

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Github Pages: blackscreen-whitetext.github.io



Projects:

(Ongoing) Portfolio Hedging Using Options: Using Linear Programs to minimize CVaR with Prof. Shashi Jain

(Ongoing) IGEM, Synthetic Biology Competition: Leveraging Generative AI to synthesise protein sequences(MiRNAs) for designing therapeutics

Online Certifications:

Generative AI with LLMs: [Course Certificate](#)

- Learnt About the various classes of transformer architectures and the usecases of various LLMs(GPT, BERT, ELMo, BART, T5, Llama)
- Used Amazon Sagemaker and experimented these concepts with FLAN-T5: Prompt Engineering, Prompt Tuning, Fine-Tuning LLMs(Parameter Efficient Methods(PEFT)), Reinforcement Learning From Human Feedback, Retrieval Augmented Generation
- Learnt about program aided models like copilot and the ReAct paper that uses chain of thought reasoning and Action Words to make the LLM generate better outputs.

Short course On LangChain: [Course Page](#)

Natural Language Processing Specialization: [Course Certificate](#)

- Implemented Naive Bayes Classifier and Hidden Markov Models for Parts Of Speech Tagging.
- Implemented An Autocomplete System using N-grams
- Implemented a Continuous Bag Of Words Model for Word Embeddings
- Used Deep Neural Networks For Sentiment Analysis
- Used RNNs, GRUs, LSTMs in Named Entity Recognition
- Used attention with LSTM for Neural Machine Translation
- Learnt about metrics to evaluate language models like ROUGE, BLEU, perplexity and benchmarks like GLUE, SuperGLUE to compare language models.
- Implemented a transformer for text summarization.
- Used the huggingface transformers library for question answering

Generative Adversarial Networks Specialization: [Course Certificate](#)

GAN Implementations: DCGAN, CycleGAN,W-GAN, Pix2Pix, StyleGAN, Data Augmentation using GANs, Conditional And Controllable Generation

Deep Learning Specialization By Andrew NG: [Course Certificate](#)

Selected Concepts: CNNs, transfer learning, RNNs, GRUs, LSTMs, Attention Models, Word Embeddings(word2vec,GLoVE), Transformers

Selected Applications: Object detection(YOLO), Image Recognition, Image Segmentation(UNet) Speech Translation

Short Course On Diffusion Models: [Course Page](#)

Machine Learning Specialization By Andrew NG: [Certificates](#)

Selected Concepts: Anomaly Detection, Recommender Systems, Deep-Q Reinforcement Learning, Support Vector Machines, K-means Clustering, PCA.

Kaggle certifications:: [Certificates](#)

Key UG Courses:

Artificial Intelligence And Machine Learning::

- Wrote a term paper and presentation to explore diffusion models' capabilities to generate images.
- Learnt to solve convex optimization problems using cvxopt in python.

Data Structures And Algorithms:: Implemented algorithms for various problems in C++ and python.

Probability And Statistics:: Learnt statistical inference in MATLAB.

Numerical Analysis:: Implemented methods to numerically solve ODEs,PDEs in python.

Algorithms And Programming:: Learnt problem solving in C

Computer Systems:: Learnt about operating systems, hardware, memory

Skills

Languages: Python, C, C++ MATLAB, \LaTeX , R, SQL, HTML, CSS, JavaScript(React)

ML Frameworks:: Tensorflow, Keras, Pytorch

LLM:: Huggingface Transformers, (Models:T5,BERT,Llama) Coding Platforms: AWS Sagemaker Jumpstart, Google Colab, Jupyter Notebook

Libraries: Numpy, scipy, Pandas, Matplotlib, Seaborn, Scikit-learn,cvxopt

Tools: Git, Linux, VS Code

Education

Indian Institute Of Science

Bachelors Of Technology In Mathematics And Computing, CGPA-9.0/10.0

Secured admission through JEE Advanced

Expected to graduate in 2026

Bangalore

2022-current

PSBB KK Nagar

School

Chennai

2007-2022

12th Percentage–96.8%

10th Percentage–95%

Volunteering:

- **Team Vicharaka:** Currently on the team of students building a mars rover for the university rover challenge.
- **Databased(The undergraduate Computer Science club):** Explained prompt engineering to students as part of our club on open day.
- **Counselling:** Volunteered to be a part of the Q&A session of the counselling process for the incoming batch of students.

Achievements

JEE Advanced: AIR 225

KVPY SA: AIR 175

JEE Mains: AIR 1005