Mani Kumar R

ksrmanikumar@gmail.com | maniksr.in | manikumar-ksr | Manikumarksr

+91-9480225156

PROFILE

Machine Learning specialist and final-year Master's student at the Indian Institute of Science with expertise in developing AI solutions for biological research and industrial applications. Skilled in deep learning, natural language processing, and explainable AI with a proven track record of delivering impactful projects and publications.

EXPERIENCE

- **Fujitsu Research of India Private Limited (FRIPL) [🌐]** *May 2024 - Aug 2024*
  AI/ML research intern Bengaluru, India
  - Conducted survey on the Explainability of time series forecasting models.
  - Developed explainable AI models for time series forecasting, reducing MSE to **0.25**.
  - Built and deployed scalable, real-time dashboards to monitor model insights using Streamlit.
- **Nanyang Technological University [🌐]** *Aug 2023 - Dec 2023*
  Research intern at Mutwil lab, NTU Singapore
  - Spearheaded a project on GPT-based gene function retrieval from 85,000 scientific articles, creating a yeast knowledge graph available at yeast.connectome.tools.
  - Leveraged OpenAI APIs and natural language processing to automate large-scale biological data integration.

EDUCATION

- **Indian Institute of Science** *2020 - Present*
  BS-MS(Research) Bangalore, India
  - **Key Courses:** Probability and Statistics | Machine learning for Data science | Linear algebra | Deep Learning | Generative AI | Computational Epidemiology
- **Blooms Pre-University College** *2018 - 2020*
  Pre-University Education Bagepalli, India
  - **Key Subjects:** Physics | Chemistry | Mathematics | Biology | English

PROJECTS

- **Visual Taxonomy: Predicting Product Attributes (Kaggle Competition)** *2024*
  Meesho Data Science Challenge. [🌐]
  - *Objective:*Developed a machine learning model to predict product attributes like color and pattern from images for e-commerce cataloging.
  - *Approach:*
    –Utilized **EfficientNet** with a custom linear classifier, applied image augmentations, and one-hot encoding for labels.
    –Employed one-hot encoding for attribute labels and applied image augmentations to enhance model generalization.
  - *Result:* Achieved a competitive f1 score of **0.73** in the evaluation metric, demonstrating model robustness in attribute prediction. Thereby reducing manual cataloging time, improving catalog accuracy, and enhancing operational efficiency and user experience in e-commerce.
- **The Yeast connectome: [Bachelor's Thesis]** *Aug 2023 - Dec 2023*
  School of Biological Sciences, NTU, Singapore | Supervisor: Prof. Marek Mutwil. [🌐]
  - Spearheaded a dynamic project titled: "GPT-based Gene Function Information Retrieval from Scientific Literature" to build a yeast knowledge graph from 85000 research articles.
  - Employed Python programming, Natural language processing, and prompt engineering in conjunction with the OpenAI API to harness the capabilities of GPT-based methods.
- **Algo Intraday options trading (2023):** *2023*
  Tools: [Backtesting.py | Upstox API] [🐙]
  - Developed and deployed intraday options trading strategy Using Python and the Upstox API.
  - Upstox API integration for automated trading execution, strategy development and backtesting.

- **Computational Genomics Project | CBRAIN Internship** *May 2023 - July 2023*
  Centre for Brain Research, IIsc | Supervisor: Prof. Shweta Ramdas
  - Conducted an intensive research internship at the Centre for Brain Research, contributing to the project "Discovery of novel eQTLs using gene expression data in smokers and non-smokers."
  - Leveraged a combination of **Linux**, **Python**, and specialized bioinformatics tools such as **qtltools** and **bcftools** to analyze complex genetic datasets and identify significant expression quantitative trait loci (eQTLs).
- **Object detector for blinds** *2022*
  Tools: [Arduino, ESP32 Cam, OpenCv, Kivy] [GitHub]
  - I prepared a prototype of an object detector that will assist blind people while walking using Arduino, an Ultrasound sensor, ESP32 CAM, and OpenCV-python. This will detect the objects and measure the distance of an object, and voice output is obtained from the application running on the phone. A sample video of this project can be found **here**.

Publications

[1] **Mani R Kumar**, Karthick Raja Arulprakasam, An-Nikol Kutevska, Marek Mutwil, Guillaume Thibault. Yeast Knowledge Graphs Database for Exploring Saccharomyces cerevisiae and Schizosaccharomyces pombe. DOI: **10.1101/2024.12.04.626523**.

[2] Karthick Raja Arulprakasam, Janelle Wing Shan Toh, Herman Foo, **Mani R Kumar**, An-Nikol Kutevska, Emilia Emmanuelle Davey, Marek Mutwil, Guillaume Thibault. Harnessing full-text publications for deep insights into C. elegans and Drosophila biomaps. BMC Genomics 25, 1080 (2024). DOI: **10.1186/s12864-024-10997-6**.

Skills

- **Programming Languages:** Python | Bash(Linux) | C++ | R
- **Web Technologies and DBMS:** HTML | CSS | FLASK | Bootstrap | CytoscapeJS | mongoDB | SQL
- **Data Science & Machine Learning:** Supervised and unsupervised algorithms | Deep learning (CNN, RNN, LSTM, GANs, VAEs) | Regularisation methods | Fine-tuning | Pre-training | Explainable AI (SHAP, LIME) | Natural Language Processing (NLP) | Generative AI | Prompt Engineering
- **Libraries & Frameworks:** PyTorch | Scikit-learn | TensorFlow | OpenCV | Transformers | Langchain | Spacy | Pandas | Pyspark | NumPy | Matplotlib | Seaborn | Networkx | Plotly | Streamlit
- **Cloud Technologies:** Microsoft Azure | Google cloud | Docker | Kubernetes

Scholarships and Awards

- **Kishore Vaigyanik Protsahan Yojana (KVPY) Fellow.** **2020–present**
- **NTU-India connect Fellow.** **Aug 2023–Dec 2023**
- **Winner: TATA Building India Essay Competition.** **2017**
- **District-level Winner: Scientific Model on Natural Resource Management.** **2016**

Certifications

- **Introduction to Retrieval Augmented Generation (RAG)** *Duke University*
- **Introduction to Generative AI** *Duke University*
- **Generative Pre-trained Transformers (GPT)** *University of Glasgow*

Extracurricular Activities

- **Coordinator of "Proscenium and Footprints" of IISc fest "Pravega 22".**
- **Chess: District-level winner in chess tournament.**
- **Enthusiast in badminton, cricket, and swimming.**