Chirumamilla Satya Keerthana

Email | Contact Number | Personal Website | LinkedIn | Github

Education

Indian Institute of Technology Kanpur *Dec'21 - Present*

Major in Electrical Engineering

Minor in Machine Learning, Computer Systems, Management Science, Cognitive Science

CPI : **8.60/10**, Machine Learning CPI : **9.68/10**

Sri Chaitanya College - Grade 11 & 12 *June'19 - July'21*

Telangana State Board of Intermediate Education, Percentage : **99.6 %**

Publications

A Survey of Applications of Multi-armed bandits in the Industrial Recommender Systems

C Keerthana, Swamy Peruru, Ravi K Kolla | Details

Supervised Hopfield Neural Networks for solving Non-Verbal Reasoning problems

C Keerthana, Shobhit Sharma, Madhuri Macharla, Nisheeth Srivastava | Details

Explainable AI for Machine learning algorithms in detextion of credit card scam

C Keerthana, Simrah Muskan, Siri, Poorvie S | Details

Research Internships

Developing a Sparse Bayesian Learning algorithm for 6G Systems *May'24 – Present*

Summer Research Intern, Wisdom Lab, Supervisor: Dr. Rohit Budhiraja

- Analysed near field **sparsity structures in 6G** wireless systems, focusing on angular, distance ring sparsities
- Constructed a **weighted Complex Gaussian mixture prior** with coupling parameters for variable sized sparsity
- Estimating the posterior using **Variational EM** and deriving the updates for hyper parameters involved

Review of Multi-Amred Bandit based Recommender Systems *Mar'24 – Present*

Intent Lab, Supervisor: Dr. Subramanya Swamy Peruru

- Analyzed over **300+ papers** and **cited over 200+** papers for writing a comprehensive review on the topic
- Discussed various non-contextual and contextual algorithms including a vast number of miscellaneous applications
- Summarised various **case studies** from companies, **trends, challenges and future directions** in the domain

Order estimation of parameters of Chirp Signal *Aug'23 – Dec'23*

Bachelor Thesis Project, Supervisor: Dr. Amit Mitra

- Analyzed complex signal processing estimators such as **BIC, BICC, PAL, MAP, AIC** for chirp signals
- Simulated estimators under normal, student-t noises using **MATLAB** for performance evaluation
- Discovered **non-robustness** in estimator performance across diverse noisy conditions and statistical environments

Facial Emotion Recognition using semi-supervised Neural Networks *May'23 - July'23*

SURGE Research Intern, PIL Labs, Supervisor: Dr. Tushar Sandhan

- Developed a facial expression recognition system using semi-supervised learning with neural networks
- Applied techniques like **Pseudo-labelling** and **Entropy Minimization**, while reviewing key literature
- Achieved **83.51%** and **84.42%** accuracy on RAF-DB with **ReMixMatch** and **Ada-CM** models

Key Achievements

- Achieved a CPI of **9.22** and stood among the **top 10%** of the class for the academic year 2023-24
- Ranked in the top 15% out of 1,200 students across the entire campus population in undergraduate studies
- Awarded the **Merit-Cum-Means scholarship** for 3 consecutive years, fully funding tuition fees
- Ranked in the top **2%** of 12K in **IIT Delhi-Optiver** Quant Contest and invited to the elite Quant workshop
- Secured All India Rank in the top **0.05%** in JEE Mains 2021 among 1 million applicants across India
- Secured All India Rank in the **top 2%** in JEE Advanced 2021 among 150K selected candidates
- Stood in the **top 1%** and secured prestigious KVPY **scholarship twice** among 100K applicants in 2019 and 2020

- Achieved **top 0.1%** rank among 164K students in TS-Eamcet 2021, Telangana State Board
- Achieved **top 0.2%** rank among 175K students in AP-Eamcet 2021, AP State Board

Industrial Internships

Building a Telugu Large Language Model *June'24 – Present*

Swecha Org, In association with Meta, Ozonotel, IIIT Hyderabad

- Developing a **state-of-the-art Telugu LLM** and **Text-to-speech (TTS)** model using diverse cultural datasets
- Integrated folklore and cultural data, enhancing the model's linguistic and contextual understanding
- Implementing advanced pre-processing techniques to optimize data for effective model and speech recognition

Model development for Sales prediction and Scam detection *June'24 – July'24*

Data Science Intern, Encryptix Technologies

- Developed a **time series model** to predict sales trends using historical data and **ARIMA** model of analysis
- Applied techniques like feature engineering and cross-validation and **SMOTE** to optimize model performance
- Built a fraud detection system using **Random Forest** and SMOTE, achieving **99%** accuracy and precision

Consumer behaviour using Data Analytics *Dec'23 – Jan'24*

TATA Group Ltd, Hyderabad

- Analyzed and visualized retail data involving **25,000+** entries and provided insights using **Excel and Tableau**
- Created **five visualizations** and an **interactive dashboard** to support decision-making in Tableau
- Recommended **marketing strategies** based on sales trends, customer loyalty, and country performance analysis

Course Projects

A Review of Models of Cognition | *CS786: Computational Cognitive Science* *June'24 – Present*

- Implemented Inception v4 from scratch to test CNN learning of symmetry on synthetic datasets
- Evaluated Gestalt principles - symmetry, proximity and closure using CNNs with custom training strategies

Cracking Companion ArbiteR-PUF | *CS771: Introduction to Machine Learning* *Mar'24 – Apr'24*

- Identified and designed **a robust feature map**, transforming 32 inputs to 528 features for cracking CAR-PUF
- Constructed a **CSVM logistic regression** model with custom polynomial features achieving a **99.1%** accuracy

Cart Pole Balancing | *EE675: Introduction to Reinforcement Learning* *Apr'24 – May'24*

- Implemented **REINFORCE** algorithm for **Cart Pole** balancing using linear policy and soft-max function
- Developed and compared performance of REINFORCE with baseline and **Actor-Critic** algorithms

Mentoring Experience

Explainable AI in the detection of credit card scam *July'24 – Sep'24*

- Mentored three sophomore students in developing XAI models like **SHAP and LIME** for machine learning
- Implemented XAI techniques on **eight machine learning models**, including KNN, SVM, and neural networks
- Developed a transparent system for fraud detection and used **metrics like F1 score, Recall, precision**

Vision Verse | *Electrical Engineering Association* *Dec'23 – Feb'23*

- Mentored **40** students in **Python programming** and **image processing concepts** including relevant libraries
- Covered image processing concepts, including **image filtering**, **segmentation** and **edge detection** techniques
- **Delivered weekly lectures** and assignments to monitor mentees' progress and guided a **Capstone project**

Relevant Courses - received an outstanding grade in all the courses

• Introduction to Machine Learning • Introduction to Reinforcement Learning • Computational Cognitive Science • Probability and Statistics • Embedded and Cyber-Physical Systems • Fundamentals of Computing • Intensive training in ML, NN, DN • Image Processing • Coursera - Machine learning specialization & Deep learning specialization

Technologies

Languages: C, C++, HTML, CSS, JavaScript, Python, MATLAB

Technologies and Libraries: LaTeX, Git, Numpy, Pandas, Matplotlib, Keras, TensorFlow, OpenCV, OpenAI