

# VIKHYATH KOTHAMASU

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## Education

### Indian Institute of Technology, Hyderabad

CGPA: 9.06/10.00

*Bachelor of Technology in Computer Science and Engineering*

*Nov. 2020 – May 2024*

Relevant Coursework: Machine Learning, Deep Learning, Image & Video Processing, Explainability in ML, Video Content Analysis, Convex Optimization, Linear Optimization, Data Science Analysis, Observational Astrophysics, NLP, RL

### Indian Institute of Technology, Hyderabad

CGPA: 9.50/10.00

*Minor in Entrepreneurship & Management*

*Aug. 2022 – May 2024*

Coursework: Design Thinking, Game Theory, Decision Modelling, Innovation Management, International Business

## Research Projects

### Astronomical classification using 5 channel images and photometric features

Feb. 2024 – Present

*Undergrad Research with Dr. Sumohana S. Channappayya*

*Hyderabad, India*

- Developed multimodal learning algorithms using CLIP architecture and a multimodal Swin Transformer for classifying compact galaxies, stars, and quasars, achieving superior accuracy compared to traditional methods.

### Adversarial Machine Learning for autonomous vehicles

Feb. 2024 – Present

*Undergrad Research with Dr. Konda Reddy Mopuri*

*Hyderabad, India*

- Investigated over 10 distinct physical adversarial attack strategies, developing targeted defense mechanisms that improve the robustness of state-of-the-art image classification models for autonomous vehicles in simulated environments.

### News-Image captioning

Jan. 2024 – May 2024

*CS5803, Natural Language Processing, IIT Hyderabad (taught by Dr. Maunendra Sankar Desarkar)*

*Hyderabad, India*

- Designed a novel News-Image captioning architecture by utilizing CLIP's image and text encoders, integrating named entities and knowledge prompts to generate contextually accurate captions with a multimodal large language model.

### Personalized Explainable Recommendation

Aug. 2023 – Dec. 2023

*AI5120, Explainability in ML, IIT Hyderabad (taught by Dr. Konda Reddy Mopuri)*

*Hyderabad, India*

- Developed a transformer-based recommendation system that integrates Personalized Prompt Learning and Knowledge Graph Attention Networks (KGAT) for explainable natural language recommendations based on user-item interactions.

### 3D Multi-Object Tracking

Aug. 2023 – Dec. 2023

*Undergrad Research with Dr. C Krishna Mohan*

*Hyderabad, India*

- Developed a robust transformer-based joint detection and tracking model for autonomous vehicles, integrating 3D LiDAR and camera data through clustering and target proposal techniques.

### Video Compression (currently under review at IEEE SP Letters)

Jan. 2023 – Dec. 2023

*Personal Research mentored by Dr. Sumohana S. Channappayya*

*Hyderabad, India*

- Developed a radial transform inspired by field dynamics and analyzed it in the context of natural video compression.
- Designed a custom video codec for the radial transform and achieved a PSNR increase of 1.53 dB while maintaining compression entropy.

### Cross-Domain Continual Learning

Jan. 2023 – May 2023

*Undergrad Research with Dr. C Krishna Mohan*

*Hyderabad, India*

- Developed a versatile model for continual learning and explored its application in federated learning scenarios.

### Message Encryption for V2X

Aug. 2022 – Dec. 2022

*Undergrad Research with Dr. Maria Francis*

*Hyderabad, India*

- Incorporated Key Policy Attribute-Based Encryption into a novel V2X communication protocol.

## Work Experience

### Salesforce

July 2024 – Present

*Associate Member of Technical Staff, Industries Cloud*

*Bangalore, India*

- Developed and implemented new features within the Contract Lifecycle Management (CLM) system to streamline contract renewal processes, improving automation and efficiency. **Tech:** Salesforce Core, Bazel, HBase

### Salesforce

May 2023 – July 2023

*Software Engineer Intern, Industries Cloud*

*Bangalore, India*

- Designed and implemented a scalable graph-based search and filter feature to identify dependent and referenced entities. **Tech:** Salesforce Core, Spring, Perforce

### Mobile Money

Jan. 2022 – Apr. 2022

*Full-Stack Developer Intern*

*Remote*

- Created an interactive Whatsapp chatbot for the pilot phase. **Tech:** Python, Twilio
- Created a cross-platform mobile application for completing transactions and keeping records. **Tech:** Flutter, Firebase

## Publications & Awards

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**P1.** Aditya Somasundaram, **Vikhyath Kothamasu**. Under Review. A Radial Transform for Video Compression. *IEEE Signal Processing Letters*.

**A1. Academic Excellence Award** (IIT Hyderabad) - for the highest GPA in the calendar year 2021.

## Scholastic Achievements

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- Developed an alumni mentoring and peer-based testing platform with AI-powered tester matchmaking, explainable recommendations for testers, and AI-generated test suites and milestones, and subsequently developed a business plan for Trumio at **Inter IIT Tech Meet 12.0**. (IIT Madras, 2023).
- Developed an optimized route planning algorithm for timely deliveries and a driver application for the Grow Simplee problem statement at **Inter IIT Tech Meet 11.0**. (IIT Kanpur, 2023).

## Skills

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**Programming Languages:** Python, C++, C, Go, Dart, Kotlin, HTML/CSS, JavaScript, SQL, Java, Octave,  $\text{\LaTeX}$

**Developer Tools:** VS Code, Google Cloud Platform, Android Studio, Bash, IntelliJ, GitHub, Git, Postman

**Technologies/Frameworks:** Linux, Windows, Tensorflow, Pytorch, Numpy, Next.js, ReactJS, Django, Flask, Firebase

**Soft Skills:** Adaptability, Teamwork, Time Management, Attention to Detail, Leadership, Critical Thinking

**Languages:** English, Hindi, Telugu, Tamil, French

## Certifications

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- Machine Learning - Stanford University
- Data-driven Astronomy - The University of Sydney
- Introduction to Statistics - Stanford University
- Algebra and Differential Calculus for Data Science - University of Colorado Boulder
- Machine Learning A-Z
- Learn Python Programming Masterclass

## Selected Projects

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**Sentiment Analysis** 🤖 | *Python, Selenium, Next.js, Hugging Face*

**Oct. 2023**

- Developed a website to provide users with a comprehensive overview of movies and TV shows.
- Implemented Selenium to dynamically collect data from the IMDb website.
- Features implemented include summarization, sentiment analysis over time, word cloud, and recommendations.

**Cryptex Portal** | *Flask, Go, ReactJS, Docker*

**Apr. 2022**

- Managed and enhanced the Cryptex event (Online Treasure Hunt) website, incorporated administrative features for streamlined moderation, and catered to a global participant base.

**Other notable projects:**

- Automated postal record-keeping using text recognition, replacing manual registers to reduce daily bookkeeping time by 85%. 🤖
- Designed and developed a college **Cab-sharing portal** 🚖, facilitating cost-effective transportation for the community.

**Selected course projects:**

- Conducted an in-depth analysis of Benford's Law distribution to assess the robustness of adversarially trained models in comparison to normally trained image classification models.
- Trained **RL-based agents** to play games like FrozenLake, Tic-Tac-Toe, etc.

## Volunteering & Extracurricular

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- Teaching Assistant** @ IIT Hyderabad. Assisted Dr. Konda Reddy Mopuri in teaching the Deep Learning course.
- Teaching Assistant** @ IIT Hyderabad. Assisted Dr. Sumohana S. Channappayya in teaching the Image and Video Processing course.
- Teaching Assistant** @ IIT Hyderabad. Assisted Dr. Rakesh Venkat in teaching the Discrete Maths course.
- Head** @ Lambda, Software Development club of IIT Hyderabad. Led multiple projects, managed several sessions and hackathons, and created awareness on Open Source through blogs.
- Experience and Hospitality Head** @ TEDx IIT Hyderabad. Oversaw speaker experience, guest coordination, and website development for seamless and captivating event execution. 🤖
- Web Head** @ Ek Bharat Shrestha Bharat. Created a new website and helped organize several events for various festivities such as Diwali, Holi, etc conducted in college.
- Represented IIT Hyderabad in multiple quizzes at the **Inter IIT Cultural Meet 6.0**. (IIT Kharagpur, 2023).
- Represented IIT Hyderabad in multiple quizzes and an oratory event at the **Inter IIT Cultural Meet 5.0**. (IIT Madras, 2023).