M HEMANTH KUMAR

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EDUCATION

B.Tech in Artificial Intelligence   Surathkal, Karnataka, India
National Institute of Technology Karnataka, IT Dept. **Current CGPA** *-* **9.8**   *2021 - 2025*

Minors in Management   Surathkal, Karnataka, India
National Institute of Technology Karnataka, School Of Management. **CGPA** *-* **9.8**   *2022 - 2024*

TECHNICAL SKILLS

Programming Languages: **Adept**:Python, SQL. **Familiar**: C++, C, HTML, CSS
Libraries and Tools: PyTorch, Sklearn, Pandas, Numpy, OpenCV, Flask, ReactJs, Pyspark, DataBricks, CI/CD Pipelining, AWS, Google Colab, Jupyter Notebook, Pycharm, VsCode, Git.
CourseWork: Datascience, Natural Language Processing, Computer Vision, Machine Learning, Deep Learning ,Data Structures & Algorithms, Artificial Intelligence, Reinforcement Learning, Parallel and Distributed Computing, Internet Of Things.

WORK EXPERIENCE

Machine Learning Intern
OmniRing, Karnataka, India   *Jul 2023 - Aug 2023*

- Built deep learning models for the tasks like gesture prediction etc. and worked on statistical techniques to find heart rate from accerlometer data
- Worked on Tensorflow-Lite for making the deep learning models to be compatible in edge devices.
- Implemented datascience and machine learning techniques for gesture prediction task (Swing-d/Swing-h).

Natural Language Processing Intern
HALE LAB, Surathkal, Karnataka, India   *Aug 2023 - Mar 2024*

- Worked on large language models for the task of finding legal entities like Winning parties, losing parties, cost, damage amounts etc. in legal documents.
- Explored the large language models and their applications in depth.
- Implemeted Incontext Learnings and Instruction Finetuning Techniques for the task of Legal NER
- Experimented with GPT-3.5/4, LLAMA-2, FALCON, MISTRAL, MIXTRAL, GEMMA-2 etc.

Software Engineering Intern
Nexus Complete Solutions, USA   *Mar 2024 - Apr 2024*

- Created a Gym website using Wordpress and Elementor. Integrated Payement Systems.
- Worked on Stable diffusion for AI Image generation. Worked on Zoho CRM.

AI/ML Engineering Intern
Cerina Health, London,England, United Kingdom   *Apr 2024 - May 2024*

- Building Emotion Recognition System to determine patient's emotion.
- Analyzing large datasets to extract meaningful insights and patterns.

AI Analyst Intern
5c Network Pvt. Ltd, Bangalore, Karnataka, India   *May 2024 - Aug 2024*

- Worked on Bounding Box Detection task for Support Devices in chest X-rays.
- Implemented Faster RCNN from Scratch and defined custom functions for the metrics used. Implemented YOLOv8 , Detectron2 and torchvision's Faster RCNN for this task.
- Worked on the classification tasks like lung nodule classification etc. Conducted Experiments to find the optimal Confidence Score and IoU Threshold.
- Implemnted Ensembling Techniques like Unanimous, Affirmative, Feature Maps Concatenation etc. for Bounding Box Detection.
- Achieved Better Performance than the Detectron2's Faster RCNN.
- Implemented Unet for Bleed and Infarcts Segmentation from scratch.
- Applied Datascience and Statistical Techniques for Data Preprocessing and Optimal thresholds for parameters.

PROJECTS

- **Unveiling Hate: A Multimodal Hate Speech And Hate Span Detection**, Leveraged Hate Speech Detection on MultiModal data (Images + Text + Emoji's) Utilised the Hateful Memes dataset that contains 10,000+ new multimodal examples created by Facebook. Used Image captioning + Text , Zero shot - Open AI's CLIP , Visual Question Answering (LLAVA) , Encoder-Decoder methods and acheived an accuracy of 73.6%. Incorporated Prompt Engineering Techniques for hatemoji Identification.Implemented Explainable AI(LIME,SHAP). for the hate span detection

- **Large Language Models For Indian Legal Text Summarisation**, Used BERT,Text rank, Lex rank, KL Summ, LSA for Extractive and BART,Pegasus, Legal Pegasus etc for Abstractive Legal Text Summarisation. Designed a user friendly website for the user to upload legal document, and the system gives summary and allows user to select the specified language for translation.

- **Framework For Sentiment Analysis and Text Data Analytics**, Built a website using streamlit and Python for Sentiment Classification and Emotion Detection. This website can extract reviews from the amazon website for the user specified product and based on that reviews,the system decides to recommend otherwise no. Implemented various models for the task of sentiment analysis and emotion detection.

PUBLICATIONS

- Framework for Bank Loan Re-Payment Prediction and Income Prediction   Link
- A Meta-Heuristic Approach for Optimizing Neural Network Model for Heart Disease Prediction   Link
- scaLAR SemEval-2024 Task 1: Semantic Textual Relatednes for English   Link
- Large Language Models For Indian Legal Text Summarisation   Link
- Automated Legal Document Annotation and Labeling using Large Language Models   **Manuscript Ready**
- Unveiling Hate : A Multimodal Hate Speech And Hate Span Detection   **In Proceedings of the Social Network Analysis and Mining Journal**
- Harnessing Large Language Models for Clinical Information Extraction from Electronic Health Records for Disease Prediction   **In Proceedings of the ACM Journal**
- Framework for Sentiment Analysis and Study on Text data Analysis Techniques   **Manuscript Ready**
- AI Generated Voice Detection   **Manuscript Ready**
- Forecasting Renal Health: Harnessing Machine Learning to Predict Chronic Kidney Disease   **Manuscript Ready**
- AI-based Integrated Framework for Vehicle Perception Applications   **In Proceedings of the ICGVIP'24 Conference**
- Advanced Smart Vehicle Perception System based on Embedded Sensor Data   **In Proceedings of the MIND'24 Conference**

ACHIEVEMENTS

- **Amazon ML School 2024** : Selected for the Amazon ML Summer School 2024.
- **D&I Award** : Selected as a recipient of a Diversity and Inclusion Award (D & I Award) for NAACL 2024.
- **SemEval 2024**: Participated in SemEval 2024 Task 1: Semantic Textual Relatedness (STR)
- **Amazon ML Challenge**: Participated in Amazon ML Challenge'23 & 24
- **96 Hour NLP Hackathon**: First Place
- **TRI-NIT Hackathon**: Shortlisted to participate in Final round
- **Kaggle Cup ML Competition**: Fourth Place
- **Research Rehashed** : IEEE NITK Research Rehashed - Fourth Place
- **AI Vision Cup** : Fifth Place.

EXTRACURRICULAR

- **Research Co-ordinator**: IE NITK
- **NSS NITK** : Student Volunteer
- **Photography Club** : Student Member
- **NAACL 2024** : Attended 2024 Annual Conference of the North American Chapter of the Association for Computational Linguistics.
- **IEEE CONNECT 2024** : Attended 2024 IEEE CONNECT Conference
- **FRUCT 2024** : Attended 35th Conference of FRUCT Association
- **ICSCCC 2023** : Attended 2023 Third International Conference on Secure Cyber Computing and Communication