

# HEMANTH KARNATI

<mailto:karnati.hemanth2123@gmail.com> | [Personal Website](#) | +91 7013505113 | [Linkedin](#) | [Github](#) | [LeetCode](#) | [Kaggle](#)

**OBJECTIVE:** Actively seeking full-time opportunities in Software Engineering and Data Science roles .

## EDUCATION

**Vellore Institute of Technology, Vellore, IN**

Sep 2020 – Jun 2024

Bachelor of Technology in Computer Science and Engineering

**New Vision Jr College**

Jun 2018 – May 2020

Class 11 & 12, TSBE

## RESEARCH PROJECTS

- **Implementation and Analysis of a Sensor-Driven Air Quality Monitoring System in Kitchen Environments** Jan 2024 – May 2024  
Developed a sensor-based air quality monitoring system for kitchens, finding TVOC levels ten times higher than typical indoor environments, marking the first such evidence in India. Utilized sensors like CCS 811, GP2Y1010, MQ135, MQ7, and DHT11, and collected data via ThingSpeak, revealing the inadequacy of common exhaust systems.
- **Comprehensive analysis of various Imputation and Forecasting Models for Improved Air Quality Predictions in Delhi (NCAA)**  
Utilized Central Pollution Control Board data (2017-2023) to analyze and predict air quality in Delhi. Applied 8 imputation methods and 17 forecasting models, identifying Bi-LSTM and LSTM with Attention as the most accurate for PM2.5 predictions.
- **Vision Transformers in Healthcare Imaging with Utilizing GAN for Data Augmentation (IEEE Conference)** Oct 2023 – Dec 2023  
Investigated the integration of GANs and Vision Transformers in healthcare, successfully expanding limited datasets for precise image classification and demonstrating the potential of advanced deep learning techniques in medical diagnostics.
- **Federated and Split Learning for Enhanced Breast Cancer Diagnosis (IEEE ACCEPTED)** Jul 2023 – Sep 2023  
Explored distributed machine learning techniques to address patient data security in healthcare, achieving high accuracy (FL: 98%, SL: 99%) and underscoring the balance between confidentiality and diagnostic precision in modern healthcare scenarios.
- **A Transformer based Federated Learning models for Recommendation Systems (IEEE Open Access)** Apr 2023 – Jun 2023  
Focused on creating Local Language Models using Federated Learning to reduce environmental impact and server load, with applications ranging from chat history to healthcare, addressing challenges in Data Heterogeneity and Communication Overhead.
- **Advanced Multimodal AI Systems for Self-Driving Cars: Accepted to MMLS Chicago 2023 (Poster)** Mar 2023 – May 2023  
Applying Self-Supervised Sparse diffusion with Audio input to improve the driving experience in bad weather, lighting, and new environments.

## PROJECTS

- **AI-Enabled Plant Disease Detection and Remedies - Leveraging OpenAI API for Smart Agriculture** – Processed a 70k+ image crop disease dataset, utilized transfer learning and finetuned the mobilenet (5 million parameters) for disease recognition. Developed a streamlit web platform for the model, integrated with GPT-4 for farmer interactions and chatting about remedies.
- **React-Based Food Web App** – Developed a dynamic platform for food exploration, using React for a responsive UI and JavaScript for advanced search functionalities, aiding in recipe exploration and dietary filtering. Leveraged HTML/CSS to design the layout, ensuring an engaging user experience.
- **WaffleHacks 2023: Image2Nutrients - Food Ingredient Recognition** – Developed within 36 hours, we finetuned a ViT-GPT 2 (200 million parameters) using a food images and ingredients dataset, integrating with GPT-4 API for nutrition insights. Rolled out a user-friendly interface using StreamLit, hosting the model on Hugging Face.
- **Stock Market App** – Built a stock visualization tool with React, real-time data updates by integrating with the Yahoo Finance API. Utilized Chart.js for graphical stock data representation, and Bootstrap for a responsive design, enhancing user experience.
- **Text Summarization and Keyword Generation Web App** – Developed a web tool with Flask to dynamically generate text summaries, utilizing SpaCy and NLTK for natural language processing, offering precise keyword extraction for quick content insights.

## TECHNICAL SKILLS

Languages: C++, Python, Java, C | Tools: Git Version Control | Web Technologies: HTML, CSS, JavaScript, React.js | Databases: MySQL, MongoDB | Cloud: AWS

## CERTIFICATIONS

[Microsoft Certified](#): Security, Compliance, and Identity Fundamentals | [Meta Certification](#): React Basics

[IBM Developer Skills Network](#): IBM Full Stack Software Developer Professional Certificate | Udemy: The Complete 2023 Web Development

[University of Michigan](#): Applied Machine Learning in Python | MongoDB University : Introduction to MongoDB