DEEKSHA HAREESHA KULAL

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PROFESSIONAL SUMMARY

AI/ML Engineer with 3+ years of experience in secure NLP and data-driven modeling. A published researcher skilled in Python, TensorFlow, and PyTorch, with a track record of enhancing adversarial robustness and model interpretability. Demonstrates strong analytical problem-solving and innovative research to develop efficient, scalable solutions for complex challenges.

PROFESSIONAL EXPERIENCE

Machine Learning Research Assistant ***August 2023 –June 2025***

Purdue University, USA *Link*

- Automated phishing detection system using Python, achieving **94.32% accuracy** with Word2Vec+SVM, enhanced by misspelling correction (Autocorrect) and word splitting (WordNinja).
- Applied advanced NLP feature extraction techniques (TF-IDF, Word2Vec, GloVe) to evaluate ML classifiers (SVM, Logistic Regression, KNN, Random Forest, MLP) via Scikit-learn with hyperparameter tuning using GridSearchCV.
- Utilized **SQL in data preprocessing** pipelines, enabling efficient model training that reduced development cycle time by **25%**.
- Enhanced preprocessing **boosted adversarial accuracy by 69.2%** on average for Word2Vec + SVM across simulated adversarial attacks by PyTextAttack.
- **Achieved 98.86% accuracy** on LLM-generated phishing emails using Word2Vec + SVM with enhanced preprocessing.
- Deployed a Dockerized Flask UI showcasing end-to-end system development and real-world evaluation
- Created **interactive dashboards** for visualizing phishing email attack trends and model performance metrics, aiding faster stakeholder decision-making.

Associate Software Engineer - ML & AI ***January 2022 – July 2023***

Bosch, India

- Automated secure software validation using Python & C, **reducing manual effort by 40%** and improving reliability via ML-based anomaly detection with **increased 26% effectiveness**.
- **Built over 100 test cases** in C++ using GoogleTest for automotive protocol testing (CAN, LIN, Ethernet) **improving release safety by 30%.**
- Led root-cause analysis using SHAP/LIME, accelerating bug resolution and improving model transparency.
- Ensured AUTOSAR compliance through collaboration with validation teams and Agile practices, cutting pre-release bugs significantly.
- Documented secure ML validation flows and **trained 5+ new engineers**, streamlining onboarding and audit readiness.

PROJECTS

Generative AI Recipe Assistant using CrewAI Agents and LLaMA *Link* ***March 2025 - April 2025***

Developed an AI-powered recipe assistant that generates structured Indian recipes using a local **LLaMA 3 model** and **CrewAI agents** for role-based task delegation. Integrated research and content-generation workflows through **YAML-configured agents**, and deployed a clean Flask-based web interface for real-time user interaction.

Machine Learning-Based Face Recognition Algorithm for Voter Recognition System *Link* ***August 2021 – May 2022***

Built a robust ML pipeline to detect deceptive behavior in emails with this methodology applicable to identifying patterns in candidate deception or talent risks. Achieved **94%+ accuracy** using semantic embeddings (Word2Vec + SVM) and evaluated robustness under adversarial input.

TECHNICAL SKILLS

- **Languages:** Python, SQL, R, C, C++
- **ML & Statistical Modeling:** Regression, Classification, Clustering, Reinforcement Learning, Experimental Design, A/B Testing
- **Libraries/Frameworks/DevOps:** Scikit-learn, TensorFlow, PyTorch,Azure, Docker, Kubernetes
- **Databases & Querying:** MySQL, PostgreSQL
- **Visualization:** Tableau, Power BI, Matplotlib, Plotly

CERTIFICATIONS

- **Machine Learning Specialization** - Regression, Clustering, Supervised and Unsupervised Algorithms, Numpy, Tensorflow *Link* ***2024***
- **Natural Language Processing Specialization** - PyTorch, Feature Engineering, Deep Learning, Transformers, LLMs *Link* **2024**
- **How Transformer LLMs work?** -Deep Learning, Embeddings, GenAI Applications, LLMOps, RAG, Transformers *Link* ***2025***
- **Microsoft Azure Machine Learning for Data Scientists** (Ongoing) - MLOps, Data Transformation, Predictive Modeling **2025**

PUBLICATIONS

- Paper titled "A survey on machine learning-based facial recognition algorithm" at ICSTSN in 2022 *Link*
- Paper titled “Phishing Email Detection Through Machine Learning and Word Error Correction” at COMSNETS in 2025. *Link*

ACHIEVEMENTS

- **Received Publication Acceptance at IEEE ICSTSN & COMSNETS**, indicating research excellence and technical leadership.
- **Nominated as Teaching Assistant** across multiple labs (Electronics, MATLAB, Software Tools), supporting over 90% student pass rate.

EDUCATION

PURDUE UNIVERSITY NORTHWEST, USA ***August 2023 - May 2025***

Masters - Computer Engineering - 3.96/4.0 GPA

Relevant Topics: Machine Learning. Big Data, Artificial Neural Networks, Software Development Practices, Computer Networks and Security

PES UNIVERSITY, Bengaluru, India ***August 2018 - May 2022***

Bachelors - Electronics and Communication Engineering and Minor Degree in Computer Science Engineering - 8.91/10 CGPA