RAKESH DONDAPATI

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Personal Statement

A dedicated, highly skilled computer science researcher specializing in machine learning, natural language processing (NLP), and cybersecurity. Demonstrates proficiency in designing and implementing sophisticated solutions on cloud computing platforms, with a track record of enhancing NLP processes for efficiency and performance. Recognized for effectively disseminating complex technical concepts to varied audiences through confident presentations and as an experienced teaching assistant. Devoted to pioneering advancements in AI-driven cybersecurity, aiming to bridge innovative research with practical applications to deliver tangible and meaningful outcomes in the field.

Education

Dakota State University, Madison, SD, USA — September 2023-Present
Master of Science, Computer Science — Graduation: May 2025
Specialization: Combined Major of Computer Science and Artificial Intelligence with Co-op
GPA: overall 3.893/4.0

Lovely Professional University, Jalandhar, Punjab, India — August 2019- June 2023
Bachelor of Technology Computer Science and Engineering (Honours)
Specialization: Combined Major of Computer Science and Cybersecurity with Co-op
GPA: overall 7.79/10

Research Experience

Graduate Assistant at Dakota State University — August 2023-August 2024

- Developed and deployed a machine learning application utilizing TensorFlow and PyTorch, implementing continuous integration and deployment through AWS CodePipeline. Achieved a 95 percent reduction in downtime by deploying on AWS EC2 and establishing comprehensive monitoring with Amazon CloudWatch. Additionally, engineered a natural language processing system leveraging LangChain and Ollama, enabling efficient topic classification and context extraction from extensive document datasets.
- Utilized state-of-the-art NLP models, including BERT and Latent Dirichlet Allocation (LDA), to perform topic classification across hundreds of documents. This facilitated the efficient extraction of main contexts, enhancing data-driven decision-making processes.

LPU Robotics and Communication Lab with Dr.Harpreet Kaur — December 2022-April 2023
Designed a Transformer-driven conditional diffusion model using imitation learning to anticipate human and robot motion trajectories, enabling predictive robot control within a model-based decision-making framework.

- Enhanced performance in cooperative robotic table transport, achieving a 10-20 percent improvement over leading learning-based methods in both simulated and real-world trials.
- Spearheaded the entire project lifecycle—from conceptualization to deployment—within a 5-month timeframe, covering system design, simulation, hardware integration, model training, experimentation, and documentation.
- Engineered a probabilistic motion planner leveraging a Spatio-Temporal Graph Neural Network (ST-GNN) to generate smooth and adaptive waypoint trajectories.
- Built a predictive control pipeline utilizing a hybrid model-based reinforcement learning strategy, integrating learned representations of human-robot interactions for long-term task optimization.

LPU Idea Hub E-Cell Lab — March 2020- October 2022
Optimized AI prompts to enhance relevance and accuracy across diverse applications.

- Assessed AI outputs for quality, implementing refinements to improve clarity and precision.
- Ensured AI responses adhered to ethical guidelines, minimizing bias and protecting user privacy.
- Performed exploratory data analysis using Python and Google Colab for a technology-driven client.
- Developed a Python module to train a machine learning model and generate performance metrics for the ML engineering team.

- Designed a query prediction model based on query session analysis, leveraging sequence-to-sequence models to recommend relevant query information such as tables, attributes, functions, and SQL keyword templates by analyzing historical user exploration patterns.
- Compiled findings and analysis into a PowerPoint presentation to effectively communicate results to the research team.

Industry Experience

We Define Net,Remote September 2022- May 2023
AI and Software Developer intern

- Optimized an AI-based resume parser using NLTK, SpaCy, and Python, increasing data extraction efficiency by 30%.
- Deployed AI-driven solutions for object detection, defect detection, measurement, and vehicle speed estimation, achieving real-time performance.
- Developed a recommendation system for user engagement and an Android ML application for on-device image recognition.
- Spearheaded an NLP chatbot project, overseeing data preprocessing, model training, intent classification, entity recognition, and API integration using Python and SpaCy.
- Deployed solutions on Edge, Azure, and Android platforms, optimizing models using TensorFlow, PyTorch, ONNX, YOLO, Detectron2, LangChain, Docker, and AzureML on both Ubuntu and Windows environments.

Lets Grow More,Remote February 2022- March 2022
Data Scientist Intern

- Utilized IBM SPSS and Weka for data preprocessing, feature selection, and model development using stacked LSTM networks to predict stock price movements.
- Performed comprehensive exploratory data analysis on large-scale financial datasets, uncovering critical patterns and trends for predictive modeling.
- Employed Apache Kafka for real-time data streaming and Hadoop for distributed storage and processing.

The Spark Foundation,Remote January 2022- February 2022
Data science and Business analyst Intern

- Applied K-Means clustering to the Iris dataset, determining the optimal number of clusters and enhancing data visualization for improved pattern recognition.
- Built and graphically represented a Decision Tree classifier, enabling accurate classification of new data inputs and facilitating informed decision-making.
- Engaged in hands-on application of machine learning algorithms to real-world datasets, strengthening skills in predictive analytics and data-driven strategies.

Publications

ResearchGate April 2025
Reconfigurable UWB MIMO Antenna System with Integrated Intelligent Metasurface for Adaptive Beam Steering and Mutual Coupling Suppression in AI-Native 6G IoT Networks

Grad Research Projects

AI-Driven Social Engineering Attacks with Dr.Shengjie Xu Spring 2024

- Conducted in-depth research on how AI/ML enhances social engineering attacks, including phishing, deepfakes, and automated deception.
- Proposed innovative AI-driven countermeasures to detect and prevent adversarial attacks targeting human vulnerabilities.
- Investigated real-world AI-enabled cyber fraud incidents, assessing the role of generative AI in automating cyberattacks.
- Created best practices for cybersecurity awareness, integrating AI-powered defense mechanisms to improve organizational resilience.

Knapsack Problem Optimization with Dr.Austin O'Brien Summer 2024

- Explored dynamic programming, greedy heuristics, and advanced combinatorial techniques for solving various Knapsack Problem variants.
- Developed Python-based programs to compare algorithmic efficiency and performance across different problem constraints.

- Conducted empirical analysis to assess trade-offs between accuracy and runtime in NP-complete optimization scenarios.
- Investigated applications in logistics, finance, and resource allocation, demonstrating the practical impact of knapsack solutions.

Machine Learning-Based Malware Detection with Dr.Abid Mehmood Fall 2024

- Developed a dual-layered system integrating static and dynamic analysis with machine learning, achieving 95 percent accuracy and minimizing false positives to 5 percent.
- Utilized Gradient Boosting, Ensemble Stacking, and Recursive Feature Elimination (RFE) for optimal feature selection, improving detection of zero-day and polymorphic malware.
- Processed and analyzed 14,000 malware and benign samples, applying SMOTE for data balancing and leveraging behavioral analysis from Cuckoo Sandbox.
- Built an efficient, high-precision model for enterprise cybersecurity, enhancing defense mechanisms against evasive cyber threats while ensuring scalability.

Projects

Music Recommendation System with Emotion Detection using ML Facial Recognition

- Developed a music recommendation system utilizing ML facial recognition techniques to determine user emotion.
- Created and curated training and test datasets for accurate emotion detection.
- Implemented facial recognition algorithms and trained a model using Python, NumPy, Pandas, Keras, and TensorFlow.
- Integrated emotion detection into the music recommendation system for personalized song suggestions. Utilized Jupyter Notebook as the IDE.

Online Store Using Git, Terraform and Jenkins

- Successfully created an online store using popular tools such as Git, Terraform, and Jenkins.
- Utilized the robust AWS Marketplace service to accomplish the project objectives.
- Implemented an e-commerce platform provided by AWS, ensuring high levels of security, scalability, and costeffectiveness.
- ILeveraged the Auto Scaling service to dynamically adjust the website's capacity, accommodating fluctuations in traffic during holidays, discounts, and special events.
- Incorporated Amazon CloudFront to optimize website performance, enabling fast and seamless delivery of content to customers.

Fitbit Data Analysis for Bellabeat Insights

- Through the analysis of Fitbit user data, valuable trends were identified that could benefit Belle beat's marketing team Python was employed for data cleaning and transformation.
- Tableau was utilized for data visualization and analysis, enabling a comprehensive exploration of the data.
- SQL was used to sort, filter, and aggregate the data before importing it into Tableau to create data visualizations. Maximizing the number of annual members is key to future growth as it ensures financial sustainability and customer retention.
- Utilized insights to devise effective marketing strategies aimed to convert more casual riders into annual members.

Other Experience

DSU CSC 247, Introduction to Artificial Intelligence, *Teaching Assistant* Spring 2024
DSU CIS 275, Web Application Programming I, *Grading Assistant* Fall 2023

Areas of Expertise

AI & Machine Learning: TensorFlow, PyTorch, spaCy, LangChain, BERT, Latent Dirichlet Allocation (LDA), YOLO, NLP (text classification, entity recognition), Generative AI, Model Deployment, Data Preprocessing, and Model Optimization.
Software Development: Java (17), Spring Boot, Spring Core, Hibernate, JPA, Node.js (20), Express.js, TypeScript, Python, Flask, C, Cobol, JCL, SOLID Principles, Design Patterns, Microservices Architecture.
Frontend & Web Technologies: React.js (18), React Query, Redux, Angular (17), Vite, HTML5, CSS3, Bootstrap 5, Jest, jQuery, JavaScript (ES6), Ajax, Axios, RESTful APIs, JSON, Zod Validation, Postman, Material UI, GraphQL.

Databases: MySQL, PostgreSQL, PL/SQL, Amazon DynamoDB, MongoDB, NoSQL.
Cloud & DevOps: AWS (EC2, S3, Lambda, CodePipeline, CloudWatch), Azure (AzureML), Docker, Kubernetes, Kafka, RabbitMQ, Jenkins, Terraform, CI/CD, Git, NPM, Webpack, Agile/Waterfall, SDLC Management.

Awards

2021 Digital Marketing : Pentaomnia club, Scholarship Award
2020 Seven Day Winter School Leadership NSS
2020 Best Presentation Award for Youth Talk LPU
2020 Best Co-Ordinator Award in Mangement At Otaku
2019 Award for the Scholarship for the Bachelor's Degree

Certifications

AI Engineer for Data Scientists Associate certificate by DataCamp	February 2024
AI-Assisted Development by KodeKloud	February 2024
Advanced Bash Scripting by KodeKloud	February 2024
Cognizant - Artificial Intelligence Job Simulation by Forage	October 2022
Modern Big Data Analysis with SQL by Coursera	May 2021

Community Involvement

LPU-National Service Scheme(NCC) , *Student Volunteer*	December 2019- March 2023
LPU-National Cadet Corps(NCC), *Student Volunteer*	June 2020 - April 2022
LPU Film Club (LFC) Tea Talks, *Co-Ordinator*	August 2020-January 2021
LPU SWAT Program, *Mentor*	September 2019-April 2020
Teach for India, *Mentor*	June 2019- December 2019

References

Dr. Austin O'Brien
Associate Professor/Coordinator for MS in Computer Science at DSU, **Email:** austin.obrien@dsu.edu, **Tel:** (605) 256-5838.

Dr. Abid Mehmood
Associate Professor of Computer Science at DSU, **Email:** abid.mehmood@dsu.edu, **Tel:** (605)-256-5838.

Dr. Mark Spanier
Associate Professor / Coordinator for MS in Artificial Intelligence at DSU, **Email:** mark.spanier@dsu.edu, **Tel:** (605)-256-5838.