Pushwitha Krishnappa

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Objective

Highly motivated Ph.D. candidate in Computer Science, specializing in Artificial Intelligence, Machine Learning, and Natural Language Processing. Passionate about using data-driven approaches to solve real-world problems, with extensive experience in building predictive models, deep learning, and NLP applications. Seeking opportunities to contribute my technical skills to innovative teams in a dynamic industry environment.

Experience

The University of Alabama in Huntsville (UAH) **Dec 2021 – Present**

Graduate Research Assistant *Huntsville, Alabama*

- Funded by Air Force Research Laboratory, Munitions Directorate, Eglin Air Force Base, Shalimar, Florida.
- Lead a team funded by the Air Force Research Laboratory focusing on the application of convolutional neural networks (CNN) to predict fluid dynamics in aerospace simulations, improving prediction accuracy by 30%.
- Developing advanced NLP models to analyze social media data, identifying key patterns in user interactions that enhance the understanding of group dynamics.

UAH **Aug 2020 – Dec 2021**

Graduate Teaching Assistant (GTA) *Huntsville, Alabama*

- GTA for: a) Introduction to Design and Analysis of Algorithms, b) Introduction to Discrete Structures, and c) Artificial Intelligence and Game Development
- Assist Professor with grading assignments and exams.

Campus Cardinals, LLP., India **Aug 2017 – Feb 2018**

Business/Data Analyst *Bengaluru, Karnataka*

- Spearheaded the analysis of student data using cluster analysis and market-basket techniques, which enhanced enrollment strategies and increased student intake by 15%.
- Developed comprehensive dashboards and reports that shaped strategic decisions regarding university partnerships and consultant engagements.

Education

Ph.D. in Computer Science **Aug 2022 - Present**

UAH, Huntsville, AL

MS in Computer Science **August 2022**

UAH, Huntsville, AL

MS in Decision Analytics **May 2020**

Virginia Commonwealth University (VCU), Richmond, VA

MBA in Business Analytics **May 2019**

Christ University, Bangalore, India

BE in Computer Science **July 2017**

Visvesvaraya Technological University (VTU), Bangalore, India

Technical Skills

Languages: Python, R, SQL
ML / DL Frameworks: TensorFlow, PyTorch, Scikit-Learn, Keras
NLP Technologies: BERT, spaCy, NLTK, Hugging Face Transformers
Data Visualization: Matplotlib, Seaborn, Tableau, Power BI
IDEs: Visual Studio Code, Jupyter, Google Colaboratory, RStudio, PyCharm
Operating Systems: Linux, Windows 10, MacOS
Cloud Services: Amazon AWS, Google GCP, Microsoft Azure
Version Control and Collaboration: Git, GitHub, JIRA, Agile Methodologies
Data Processing and Analytics: Pandas, NumPy, Scipy, Exploratory Data Analysis (EDA), Statistical Modeling, Time Series Analysis, Data Acquisition and Validation
Machine Learning Algorithms: Regression, Classification, Clustering, Dimensionality Reduction
Deep Learning Techniques: CNNs, RNNs, LSTMs, Transformers

Projects and Publications

Demo: SensiTrain: A Crowd Supported Platform to Understand Context and Improve Sensitivity in Online Communication – Collaboration with University of South Florida *(Publication Link)*

- Developed SensiTrain, a crowd-supported platform designed to curate datasets for understanding the impact of cultural, gender, race, and national origin differences on the perception of social media posts.
- Designed a system to categorize social media statements as benign or hurtful, incorporating user feedback to improve sensitivity in online communication.
- Aimed to mitigate unintentional harm on social media by enhancing cross-cultural understanding and trustworthiness of AI-driven inferences.

Computational Fluid Dynamics – Next Frame Prediction *(Pending Publication)*

- The project involved development of a Convolutional Neural Network (CNN) model to accurately predict a frame using previous frames.
- A video sequence was split into numerous frames(images) to train the CNN model as well as to validate it.
- A 3D CNN model was developed to predict the nth frame utilizing data from the preceding frames.
- The 3D CNN model captured both spatial and temporal information from video data for precise frame predictions. As a result, the model effectively learned underlying patterns and dynamics within the video sequence leading to more accurate and reliable predictions.

Inference of Leader-Follower Relationship in Reddit *(Pending Publication)*

- The group research involved conducting an in-depth analysis on Reddit user interactions.
- The research focuses on studying implicit leader-follower relationships in large social networks to better understand the formation of exclusive and inclusive subgroups.
- Exclusive groups can create echo chambers for radical ideas, while inclusive groups often play a moderating role.
- The study uses a custom-designed crawler to gather data from the top 25 subreddits on Reddit. The findings demonstrate that both types of groups can be identified through communication patterns within the social network.

Chatbot - National Institute of Justice (NIJ) research – Collaboration with Florida State University and Purdue University *(Pending Publication)*

- The primary goal of this chatbot research is to develop intelligent and interactive chat systems by identifying the context of users' query's and generating appropriate responses.
- To achieve this goal, various techniques are analyzed and compared to design chatbots that understand the semantics of the topic and derive similarity measures among sentences.
- Natural Language Processing (NLP) techniques are used for data preprocessing and feature extraction.
- The BERT (Bidirectional Encoder Representations from Transformers) model, RoBERTa (Robustly Optimized BERT Pretraining Approach) and DistilBERT (A Distilled version of BERT) transformer variations are used to create embeddings of the data leading to better identification and more accurate clustering of sentences.

3D reconstruction of indoor images - National Institute of Justice research – Collaboration with Florida State University and Purdue University *(Pending Publication)*

- The goal of the research is to create a 3D reconstruction from a set of indoor images.
- To achieve this goal, we are investigating the potential of Siamese Neural Networks for indoor 3D reconstruction, aiming to improve the accuracy and efficiency of spatial structure representation in interior environments.

Chatbot Development for Car Sales and Rental Company Using Large Language Models (LLMs) *(This Project has no Publication)*

- Developed an AI-powered chatbot using pre-trained models like BERT and GPT-2 for to automate customer service inquiries, reducing agent workload.
- Implemented sentiment analysis on customer reviews using Scikit-Learn, achieving an F1 score of 0.92.
- Integrated English-to-Spanish translation with BLEU score assessment for quality control.
- Applied extractive QA with Hugging Face models to extract brand insights from reviews, improving customer feedback analysis.

Professional and Academic Distinctions

- **Leadership Role:** President, Association of Computing Machinery – Women (ACM-W) at UAH.
- **Achievements:** Awarded Second Place in the UAH Computer Science Department Annual Poster Presentation Competition, Fall 2023.
- **Memberships:** Association of Computing Machinery; Invited member of National Society of Leadership and Success.