Nikita Ravi

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Education

Purdue University August 2022 - May 2024
M.S. Computer Engineering

Purdue University August 2018 - December 2022
B.S. Computer Engineering

Coursework

Courses: Artificial Intelligence, Computer Vision, Deep Learning, Statistical Machine Learning, Natural Language Processing, Python for Data Science, Data Structures and Algorithms, Object Oriented Programming in Java, Computer and Network Security, Quantum Computing, Random Variables and Signals, Differential Equations, Linear Algebra
Awards: Dean's Honor List, Semester Honors

Skills

Programming Languages: Python, SQL, Apache Spark, Java, C, MATLAB, LaTeX
Machine Learning: PyTorch, Tensorflow, Lightning, HuggingFace, Langchain, OpenCV
Tools: Git/GitHub, Unix Shell, Weights and Biases, Docker, AWS Sagemaker, SLURM
Languages: English, Japanese, Telugu

Work Experience

Salesforce | *Software Engineer* July 2024 – Current

- Developed an AI agent that would analyze the question asked, retrieve relevant data/context, and deliver context-aware responses or visualizations, streamlining information access for customers.
- Implemented automated health checks in Python using SNMP to monitor network devices, detect issues, and trigger alerts for proactive maintenance.

Salesforce | *Software Engineer Intern* June 2023 – August 2023

- Fine-tuned an existing pre-trained causal LLM transformer for its text generation capabilities to answer any question pertaining to Salesforce's internal network health monitoring website.
- Experimented and fine-tuned different transformers like BERT, GPT2, Falcon, and Salesforce's own xgen models.
- Achieved an accuracy of 92.85%.

Salesforce | *Software Engineer Intern* May 2022 – August 2022

- Trained a K-Means model to cluster network devices by their configurations using NLP TF-IDF computations.
- Displayed the clustering on a three-dimensional graph using a type of dimensionality reduction method called Principal Component Analysis.

Lenovo | *DevOps Engineer Intern* June 2021 – August 2021

- Implemented a software that effectively detects and redacts customer's PII and Lenovo's confidential data using Named Entity Recognition.

Lenovo | *User and Customer Experience Co-Op* January 2020 – August 2020

- Wrote Django-admin commands to manage and update information, and send notifications to users regardling the status of their parts in Lenovo's internal inventory tool.
- Developed an ETL script to load customer experience data into a SQL server and identify trends.
- Trained a decision-tree model to predict the probability of Lenovo's customer support case getting resolved.

Research Experience

SERIS Lab | *Research Assistant* August 2023 – May 2024

- Explored the reproducibility crisis and surveyed methodologies to enhance the reproducibility of training cutting-edge deep learning software
- Improved the reproducibility of training and evaluating an efficient and low-powered computer vision model known as the Tree-Based Unidirectional Neural Network (TRUNK)

Probabilistic and Understandable Machine Learning Lab | *Research Assistant* January 2022 – May 2022

- Constructed a StarCraft II Benchmark dataset that is easily accessible and useable for ML projects
- Trained the ResNet-18 Network to predict the number of casualties from a specific frame of the game

Publications

[In Progress] **N.Ravi**, A.Goel, "Improving the Reproducibility of Deep Learning Software: A Case Study Analysis"

A. Goel, C. Tung, N. Eliopolous, N. Ravi, N. Synovic, I. Ahlgren, J. West, G. K. Thiravathukal, J. C. Davis, Y.-H. Lu, "Advancing Low-Power Computer Vision at the Edge", [Link]

B. Chou, P. Jajal, N. J. Eliopoulos, T. Nadolsky, C.-Y. Yang, N. Ravi, J. C. Davis, K. Y.-J. Yun, Y. Lu, "A Musician's Muse: Detecting Performance Errors with Transformers", AAAI Submission, [Link]

Projects

Computer Vision Pipeline for the Lunar Rover | *PyTorch, ROS, Git, Unix Shell* January 2021 - December 2022

- Developed a computer vision pipeline to transform lunar rover images into a bird's-eye view perspective.
- Engineered a multi-step process involving image deblurring, semantic segmentation, and perspective transformation.
- Utilized DeblurGAN-v2, Detectron, and uNetXST to enhance image processing and accuracy.

Classifying Short Sentences | *PyTorch, Git, Unix Shell* August 2021 – December 2021

- Implemented a BiLSTM-based NLP model with attention mechanisms, linear, and convolutional layers for classifying short sentences.
- Reproduced and optimized an academic research paper, refining architecture, training, and evaluation techniques.

Rogue Game | *Java, Git, Unix Shell* August 2020 – December 2020

- Developed a text-based RPG inspired by the 1980 Rogue game, featuring procedural elements.
- Parsed XML files to extract and manage in-game data for maps, weapons, and monsters.
- Integrated key bindings for movement and combat mechanics, enhancing gameplay interactivity.

Certifications

Google Generative AI Certification June 2023

- Covered LLMs, Attention Mechanisms, Intro to BERT

IBM Data Science Professional Certification August 2019

- Covered Database and SQL, Data Analysis, and Machine Learning

JLPT N2 Certification February 2016

- Japanese Government issued 2nd Highest Level Language Proficiency Exam