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DIVYADHARSHINI MURUGANANDHAM

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EDUCATION

MS in Computer Science, Khoury College of Computer Sciences, Northeastern University.   **Sep'22 — Dec'24***
Courses: *Program and Design Paradigm, Database Management Systems, Algorithms.* **GPA:4.0/4.0**   **Boston, MA**
BE in Computer Science, Kumaraguru College of Technology.   **Aug'15 — Apr'19**
GPA: 3.8/4.0, *Ranking: 1/120 [Gold Medalist]*   **Coimbatore, India**

TECHNICAL SKILLS

Industry Knowledge: FullStack Development, Machine Learning, Data Science,Visualization, NLP, Vehicle Simulation.
Programming Languages: FREMP Stack (Flask, ReactJS, MongoDB, Python), NodeJS, R, C, C++, Java, Perl, MATLAB.
Web Technologies: HTML5, CSS3, JavaScript, React.
Databases: SQL, MySQL,MangoDB, PostgreSQL.
Frameworks: Tableau, Microsoft PowerBI.
Data Science: Statistical Analysis, Feature Engineering, Data Analysis,Data Visualization, Stochastic Models, A/B Testing.
Machine Learning Packages: TensorFlow, PyTorch, Caffe, Scikit-Learn, Azure-ML, Sage-Maker Studio, XGBoost, SHAP.
Devloper Tools: Docker, Git, AWS NeuronSDK, CUDA, HL7, IHE, ETL, Postman, AWS - S3, LaTex.
Other Skills: Team Player, Critical Thinking, Problem Solver, Mentor, Public Speaking.

WORK EXPERIENCE

Khoury College of Computer Sciences, Northeastern University   **Boston, MA**
Graduate Teaching Assistant, *CS6120 - Natural Language Processing*   **Jan'24 - Present**
- Duties: Assisting is forming a syllabus, proctoring exams, evaluation of individual project ideas by mentoring students, grading exams and projects by running various implementation models.

Khoury College of Computer Sciences, Northeastern University   **Boston, MA**
Graduate Student Researcher, *Information Content of Associations in Complex Networks*   **Jan'24 - Present**
- Planed to develop and implement a novel estimation procedure to identify statistical associations in complex networks, emphasizing the quantification of attributable relative information, with a focus on biological applications.
- Understanding made on information content within complex networks by applying advanced mathematical and analytical skills to drive the research.
- Incorporated theoretical and computational approaches in a methodological study within biological contexts.

Khoury College of Computer Sciences, Northeastern University   **Seattle, WA**
Mentor and Student Researcher, *Use of AI and Immersive Technologies in Creating Inclusive Classrooms*   **Aug'23 - Present**
- Created and designed visualizations to show an incredibly effective pedagogical tool.
- Involved in creating a simulation using the Unity game design software for concepts such as repetitive constructs, recursions and sorting algorithms.
- Utilized vector databases for data retrieval and integrated GPT-based models, empowering chatbots with advanced capabilities.
- Mentored undergraduate research assistants in web design, python programming and problem-solving methodologies for real-world applications.

Khoury College Scoial leadership club, Northeastern University   **Seattle, WA**
Vice President   **Sep'23 - Present**
- Led and coordinated diverse initiatives by overseeing event planning, fostering member engagement, and supporting organizational objectives.
- Collaborated closely with the President, offering support in organizing and executing club activities.
- Involved in motivating and encouraging students, fostering inclusivity, and actively participating in decision-making processes.

Data science Intern, Commute Seattle   **Jun'23 - Aug'23**
- Explored the data set collected through a public survey of timeline to understand the preferences of the Seattle non-work trips and its neighbouring region commuters.
- Insights are made and targeted at the transportation and policy leads of specific demographics including zipcodes.
- Analyzed and created a new commute programs that better meet the needs of Seattle population.

Khoury College of Computer Sciences, Northeastern University   **Seattle, WA**
Graduate Student Researcher, *Language Acquisition Research - Second language development using NLP*   **Jan'23 - Aug'23***
- Performed conversation text annotation using BRAT and created annotation scheme for Named Entity Recognition, Part-of-Speech tagging, sentiment analysis, and text classification on predefined labels.
- Handling ongoing research and studies in finding the best machine learning model to be trained on large amount of text data annotated using BRAT, to learn pattern and structures of the second language.
- Working on publishing a paper on best NLP models for second language development by analyzing conversational alignment.

Lead Graduate Teaching Assistant, Khoury College of Computer Sciences June'23 - Aug'23
- Designed a syllabus and lecture notes for Data structures, Algorithms and Application in Computer Systems - (CS 5008).
- Duties: Conducting class, grading exams, having office hours to guide students on their projects, arranging for guest lectures for students by external faculties and industry mentors.

Graduate Teaching Assistant, Khoury College of Computer Sciences Jan'23 - Apr'23
- Handled lectures for Object Oriented and Design - (CS 5004).
- Conducting lab sessions, conducting exam reviews sessions, grading & proctoring exams, guiding students on their final projects.

Bosch Global Software Technologies **Banglore, India**
Member of Data Science and AI community - Researcher **Jul'20 — Aug'22**
- Built and trained a one class LSTM autoencoder to detect anomalies in braking maneuvers during active safety braking system validation tests by calculating mean absolute error.
- Employed Gaussian Naive Bayes classifier to analyze and debug the measurement log taken from mm6 device by end users to provide expert knowledge summary on errors. The system conserved manual efforts from 5 hours to 2 hours.
- Developed an Automatic Number Plate Recognition system using YOLOv4 darknet framework which detects the number plate from video sequence and PP-OCR model for the text recognition. The system was trained and tested with 10-12 FPS along with 90% accuracy having a dashboard feature for analytics display.

ACADEMIC PROJECTS

HELLA - Smart reading bot for visually challenged people — *Python, NLTK, RNN, OCR, Google TTS, Raspberry Pi*
- Developed an integrated system that uses a camera as an input device to feed text documents and an OCR software module to process the scanned documents.
- Performed text analysis and produced classified text to speech output which is given via the connected output device.
- Implemented speech-to-text analysis which allows people to interact with it and receives audio output. The system was developed as a device with a power backup and achieved **92% accuracy**.

GreenFridge – Machine Learning Based Smart Fridge — *Flask, ReactJS, Google Cloud Firebase, Python, Google Vision API*
- Computer-vision-based IoT smart device that tracks food in fridge and monitors user behavior using cloud application for efficient analysis of carbon consumption and educates users from an improved sustainability standpoint.

NYC 311 Complaint Type Prediction — *Python, NLP, BERT, SQL, Matplotlib*
- 311 is a service that New York City residents can use to make non-emergency reports. The NYC 311 Dataset was made public by NYC OpenData and has about 40 columns and around **21 Million Rows**.
- Experimented with Traditional ML Models and Transformers to Predict the Type of the Complaint with the complaint text leveraging Natural Language Processing.

CIFAR-10 image classifier using Convolutional Neural networks — *Python, CNN, Image Data Processing*
- Built a Neural network model with multiple convolutional layers (CNN), cross-entropy function and SGC optimiser. Improved the performance by increasing number of layers and epochs with **85% accuracy**.

PowerDowner– *Use less energy (Industry Experience Project)*
- Exploratory Data Analysis was performed on the energy rating system and offered recommendations to reduce energy consumption.
- Worked effectively in a cross-functional and a multicultural team in a collaborative platform, analysed various stakeholders requirement to design an innovative and a scalable solution that helps in strategic decision-making.
- Developed a web application reporting with KPIs, highlighting the average annual consumption, carbon emission usage and estimated bill value based on customers home appliances.
- Created technical documents with the procedures involved in data pre-processing including data extraction, data exploration and manipulation, data visualisation, risks involved in the project, along with the possible enhancements for the existing features.

PUBLICATIONS AND CERTIFICATIONS

GDP based medal count analysis in Summer Olympics for two decades - Exploratory Data Analysis - IJRTE Journal. PAPER
HELLA - A smart reading bot for visually impaired people - WSEAS/IJEAT Journal. PAPER
Analyzing conversational alignment and second language development using NLP - NEU Research Symposium. POSTER
NIPUN - Master's in Machine Learning - Advanced ML certified.
Data science Infinity - Complete skill set of a Data Scientist.

HONORS, AWARDS AND ACADEMIC ACHIEVEMENTS

- Received the Most Innovative award for bringing impactful data visualization and ground breaking solutions at Commute Seattle.
- Received the Lifelong Learner award for dedicatedly identifying key business challenges at Commute Seattle.
- Received Made a Difference award for being a motivational leader and mentoring freshers at Bosch Tech Trends Team.
- Received the SPOT award for good team player and innovative thinking at BOSCH during AI/ML pitch day.
- Received the SPOT a award for working collaboratively and managing complexity during major project releases.
- Awarded SHABASH for delivering the best results by appreciating the efforts in AI research grad program projects.
- Awarded SHABASH for contributing technical and creative ideas for the department's monthly magazine at BOSCH.