

ARPON KAPURIA

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Education

National Institute of Technology, Tiruchirappalli

B.Tech in Computer Science and Engineering

July 2020 – June 2024

Tamil Nadu, India

Relevant Courseworks

- Linear Algebra and Calculus
- Database Management Systems
- Machine Learning
- Data Structures and Algorithms
- Augmented and Virtual Reality
- Deep Learning
- Operating Systems
- Technical Writing
- Image Processing and Applications
- Computer Networks
- Artificial Intelligence
- Natural Language Processing

Experience

Indian Institute of Technology Bombay

Research Intern - MeDAL Lab

May 2023 – July 2023

Mumbai, India

Project 1: Enhancing Self Supervised Learning framework - BYOL

- Conducted an extensive literature survey on self-supervised learning, emphasizing contrastive learning principles and frameworks like simCLR, MoCo, and BYOL.
- Reproduced the BYOL framework using PyTorch, replicating the original work to establish a solid foundation for subsequent modifications.
- Introduced innovative changes to BYOL, such as formulating a new algorithm, incorporating a novel loss function, and architecture adjustments for a better representation learning. Hyperparameter tuning was conducted to optimize the training procedure.

Project 2: Radiology DICOM Image Anonymization

- Created a user-friendly system for DICOM image upload and processing using Flask, along with a Python script using Pydicom for efficient anonymization, addressing medical data privacy concerns.
- Performed a testing using the CRAFT model for text detection and extraction from X-ray images, enhancing the interpretability and utility of medical imaging data.

National Institute of Technology Tiruchirappalli

UG Research Assistant - Industrial Automation Lab

October 2022 – February 2023

Tiruchirappalli, India

Project: Centralized Power Cluster Home Automation

- Developed a Flutter app to automate the operations and billing for a power cluster in Assam, India, serving 200 homes.
- Integrated Flutter front-end with API developed in Django and used an MQTT server for IoT communication.

Projects

9 Box Puzzle - Android App

December 2022

Java, A* Algorithm

- Designed and programmed an engaging 9-puzzle game in Java, featuring a 3x3 grid of numbered boxes from 1 to 8, with a missing 9th box in random order.
- Provided comprehensive in-app resources, including a home menu, how-to-play guide, optimal solution visualization, and a performance tracking system for user statistics and puzzle difficulty based on the minimum moves required.
- The optimal solution window displays step-by-step moves needed to solve the puzzle most efficiently, utilizing an AI-based algorithm (A* Algorithm).

Malicious Website Detection Using Machine Learning

September 2022 – November 2022

Python, Flask, HTML/CSS, JavaScript

- Implemented a machine-learning model with around 94% accuracy to detect malicious websites.
- Trained and compared different models using K-Nearest Neighbor, Support Vector Machine, Logistic Regression, and Multi Layer Perceptron to obtain a better performance.
- Built a chrome extension using JavaScript to extract the features from the webpage to test the website against the trained model to classify if it is malicious or not. Added a feature to receive user feedback.
- Applied a continual learning approach to store the user feedback and retrain the model daily to improve performance.

Skills

Programming Languages: C, C++, Python, Java, Dart, HTML/CSS, JavaScript, SQL

Frameworks: Flutter, PyTorch, Flask, Unity, Tailwind CSS

Miscellaneous: Docker, VS Code, Android Studio, Git, Google Colab, Latex

Languages: Bengali (Native), English (Advanced), Hindi (Verbal), German (A1.1)

Standardized Test Scores: GRE - 307 (Q 157, V 150), IELTS - 7.5

Achievements

2020 Indian Council for Cultural Relationship (ICCR) scholarship awardee – selected as one of the 180 students from Bangladesh for this Fully Funded Scholarship to study in India, granted by the Government of India.

2017 Awarded the Merit Order Scholarship by the Chamber of Commerce, Kushtia, Bangladesh, for remarkable achievement in the 10th grade board exams.

2015 Received the General Grade Scholarship from the Government of Bangladesh, for outstanding performance in the 8th grade board exams.