

RAHUL KANDASWAMY

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HMT Layout Nagasandra Bangalore Karnataka

ASPIRANT

Motivated and passionate individual with a good academic background in machine learning seeking an opportunity in the same domain. Eager to apply theoretical knowledge, gain practical experience, and contribute to ML projects in a professional setting.

TECHNICAL EXPERTISE

- **Programming Languages:** Python, C++,
- **Machine Learning Frameworks:** ScikitLearn, PyTorch, TensorFlow
- **Data Visualization:** Matplotlib, Seaborn
- **Data Preprocessing and Analysis:** NumPy, Pandas
- **Database:** SQL and NoSQL
- **Analytical Skills:** Strong analytical and problem-solving skills
- **Image Processing Techniques:** Point operation, Histogram Equalization, Neighborhood Processing
- **Deep Learning Algorithms and Techniques:** Convolution Neural Network, Recurrent Neural Network etc..
- **Computer Vision Libraries:** OpenCV, Matlab.
- **Data Structure and Algorithm:** Array, Linked List, Stacks, Queues, Trees, Graphs, Binary Search, Recursion, Sorting
- **Microsoft Azure AI Fundamentals:** Automated ML [verify](#), Computer Vision (CV) [verify](#), Natural Language Processing (NLP) [verify](#), General AI (GenAI)

PERSONAL PROJECTS

Smart Tracing Using ANPR (Automatic Number Plate Recognition)

Description: Addressed the increasing need for efficient road **traffic monitoring** and **crime reduction** in India through the **integration of AI and ML** with public CCTV cameras. Aimed to enhance law enforcement capabilities by identifying and tracking vehicles involved in criminal activities.

Solution:

- Developed a prototype to reduce crime rates by integrating AI and ML with public CCTV cameras.
- Utilized **OpenCV** and **pytesseract** for license plate recognition.
- Mapped camera coordinates to construct routes from crime scenes to potential locations.

Methodology (Phases):

- **Detection:** Employed Python libraries including pytesseract, OpenCV, and cv2 to recognize license plates from camera inputs.
- **Storage and Analysis:** Utilized Pandas Dataframe and MongoDB to store and analyze detected license plates and camera coordinates.
- **Mapping:** Leveraged Geopy and Folium to obtain position coordinates and mark locations on a map based on recognized license plates.

Impact: Enhancing law enforcement's ability to monitor and respond to criminal incidents, ultimately improving public safety and demonstrated proficiency in AI/ML integration, license plate recognition, and geospatial mapping.

FashionMIST Classifier

12/09/2023 - 29/09/2023

I **Independently implemented** a **multiclass classifier** model, specifically a **FashionMNIST classifier**, utilizing a **Convolutional Neural Network (CNN) architecture**.

- **Data Transformation:** Imported and meticulously transformed the dataset from the **torchvision library**, including **encoding categorical labels into numerical values**.
- **Input Processing:** Prepared the input data by flattening it, ensuring each pixel's value was correctly fed into the input layer of the CNN.
- **Optimization Strategy:** Employed **stochastic gradient descent** for model optimization, carefully fine-tuning hyperparameters to achieve optimal results.
- **Loss Function:** Utilized the **cross-entropy loss** for accurate and robust loss calculation during model training.
- **Outstanding Accuracy:** Through this approach, I **achieved** a commendable **accuracy of 85%** during the **training of the model**.
- **Demonstrated Expertise:** This project serves as a testament to my ability to excel in **image classification tasks**, skillfully leveraging **CNNs** and employing **standard machine learning techniques** to consistently deliver strong and reliable results.

Secure Lock: A Digital Solution

04/10/2023 - 03/12/2023

Description: Addressed security challenges in traditional bank locker systems by introducing an innovative solution that combines multi-factor authentication and IoT technology. Utilized facial recognition, fingerprint authentication, and mobile OTP verification to enhance security and convenience.

Requirements: Key functionalities included biometric authentication, remote monitoring, access control, and real-time notifications. Utilized fingerprint sensors, cameras, microcontrollers, cloud-based storage, and software for user management and data storage.

Technologies Used: Raspberry Pi Zero, Firebase database, OpenCV, Python, Light Sensors and buzzers
Features:

- **Multi-factor Authentication:** Implemented facial recognition, fingerprint authentication, and mobile OTP verification for enhanced security.
- **Remote Monitoring:** Enabled real-time monitoring of locker status and access control.
- **Real-time Notifications:** Provided users with instant notifications regarding access and locker activity.
- **Cloud-Based Storage:** Utilized secure cloud storage for data management and user profiles.

Impact: SecureLock IoT redefined bank locker security by combining advanced authentication methods and IoT technology, setting new standards for securing valuable assets. A catalyst for the future, it offers unmatched security and convenience, not only in banking but across various industries.

EXPERIENCES

Raptech Inc

Jan 2024 - Present

Deep Learning Intern

Description: As an intern at RapTech Inc., I have played a pivotal role in the **development and deployment** of a sophisticated **image classification model using the VGG-16 architecture**. In addition to **model construction** and **dataset creation**, I successfully **designed and implemented an API** that facilitates seamless **access to the classification model**, enhancing its practical utility.

Key Accomplishments:

- **Model Development:** Engineered and **fine-tuned the VGG-16 model** for **image classification tasks**, leveraging its **deep convolutional layers for feature extraction**.
- **Custom Dataset Creation:** Curated a specialized dataset tailored to the model's unique requirements, employing robust data collection, preprocessing, and augmentation techniques.
- **API Development:** Designed and implemented a user-friendly API that allows easy integration with the classification model. **The API enables users to input data for classification and receive results in a structured JSON format.**

- **Training and Optimization:** Implemented transfer learning techniques, utilizing **pre-trained VGG-16 weights to enhance the model's learning efficiency.**
- **Evaluation and Validation:** Conducted rigorous evaluation and validation processes, utilizing metrics to ensure the model's accuracy and generalization capabilities.
- **Collaboration:** Collaborated with **cross-functional teams to integrate the classification model into larger systems and solutions**

Impacts:

Enhanced Decision-Making: The successful classification of the custom image dataset has empowered data-driven decision-making processes. The model's accuracy and precision contribute to more reliable insights, aiding in strategic and operational decisions.

Interdisciplinary Collaboration: Collaborating with cross-functional teams has fostered a holistic understanding of the project's impact. The integration of the model into broader systems enhances interdisciplinary collaboration, promoting a unified approach towards achieving organizational goals.

Accessible Insights: The implementation of an API has democratized access to the classification model, making its insights accessible across various applications and workflows. This accessibility broadens the reach of the model's impact, fostering innovation in diverse areas.

Real-world Applicability: Emphasized practical applications, addressing industry-specific challenges and making the model a valuable asset in tangible problem-solving.

EDUCATION

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| Bachelor of Technology Presidency University, Bangalore 2020-2024 | Bangalore(INDIA) 2020-2024 |
| Pre-University Seshadripuram pu college 2017-2019 | Bangalore(INDIA) 2017-2019 |

CERTIFICATIONS

- Supervised Machine Learning: Regression and Classification
[Verify Certificate](#)
- Python Programming Workshop
[Verify Certificate](#)