Face Mask Detection

PICT, PUNE

Project Duration: March 2022 - August 2022

Objective:

The objective of the Face Mask Detection Algorithm project was to develop an AI/ML-based solution for real-time detection of individuals wearing face masks. The project involved the creation and training of a robust model using a comprehensive dataset comprising images of people with and without face masks. The ultimate goal was to achieve a high level of accuracy in detecting the presence or absence of face masks, thereby facilitating the implementation of effective safety measures, particularly during the COVID-19 pandemic.

Features:

- Large-Scale Image Dataset: Curated and utilized a large dataset of diverse images, encompassing individuals wearing face masks and those without face masks, to ensure the robustness and generalizability of the trained model.
- Data Preprocessing and Augmentation: Employed various data preprocessing techniques, including image normalization, resizing, and augmentation, to enhance the model's ability to accurately identify faces and distinguish between masked and unmasked individuals under various environmental and lighting conditions.
- Convolutional Neural Network (CNN) Architecture: Developed a sophisticated CNN architecture using Python, incorporating layers for feature extraction and classification, enabling the algorithm to efficiently learn complex patterns and features associated with facial recognition and mask detection.
- Training and Validation Process: Implemented a rigorous training and validation process, optimizing the model's hyperparameters and fine-tuning the network to achieve an impressive accuracy rate of approximately 95%, ensuring reliable and precise face mask detection results.
- Real-Time Application Integration: Integrated the trained model into a real-time application, allowing for seamless and instantaneous detection of individuals wearing face masks within various settings, such as public spaces, transportation hubs, and healthcare facilities.
- Alerting Mechanism: Configured an alerting mechanism within the application to promptly notify authorities or relevant personnel in cases where individuals were detected without face masks, enabling swift intervention and adherence to established safety protocols.

Outcome:

The successful implementation of the Face Mask Detection Algorithm showcased the potential of AI/ML in contributing to public health and safety initiatives, particularly in the context of infectious disease management. The project's high accuracy rate underscored its reliability and effectiveness in supporting the enforcement of face mask mandates and promoting a culture of responsible public health practices within communities.