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| **Title of the Project** | **:** | A LIGHTWEIGHT DEEP LEARNING FRAMEWORK FOR REAL-TIME FACE MASK DETECTION USING MOBILENETV2 |
| **Submitted by** | **:** | |  |  |  | | --- | --- | --- | | **S. No** | **Register Number** | **Name of the students** | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |
| **Guide** | **:** |  |

**SYNOPSIS**

Face mask detection is an important application in computer vision and public health surveillance, focusing on ensuring safety compliance in crowded and sensitive environments. The task involves automatically identifying whether individuals in an image or video frame are wearing a mask. Conventional approaches based on manual feature extraction or shallow classifiers often struggle with accuracy, scalability, and adaptability to diverse real-world conditions such as lighting variations, occlusions, and different mask orientations. To overcome these challenges, this project introduces a deep learning-based framework for robust face mask detection using the MobileNetV2 architecture. MobileNetV2, a lightweight pretrained Convolutional Neural Network (CNN), strikes an effective balance between accuracy and computational efficiency, making it suitable for resource-constrained devices. The workflow integrates preprocessing techniques such as resizing, normalization, and augmentation to standardize inputs and improve generalization. Transfer learning is employed to adapt the pretrained MobileNetV2 to the specific task of classifying facial images into two categories: “with mask” and “without mask.” The model is trained on a dataset of 7,553 RGB images and tested with custom input images for validation. Prediction results are visualized in real time using OpenCV, providing instant feedback for practical deployment. Implemented in Python with TensorFlow/Keras, the proposed system reduces computational overhead, accelerates inference speed, and ensures reliable performance.

**BLOCK DIAGRAM:**

Input Digital Image

Preprocessing [Resizing & Normalization, Augmentation]

MobileNetV2 Feature Extraction

Visualization & Confidence (Labels + Scores Display)

Classification (With Mask and Without Mask)

Deployment in Python (TensorFlow/Keras)

**Signature of HOD Signature of the Guide**

**Remarks of the Member / Monitoring Committee:**

**Recommended / Not recommended APPROVED / NOT APPROVED**

**Signature of member / Monitoring Committee signature of Head of**

**(Name, Designation & Address) Monitoring Committee**