Personal Contribution

- I was responsible for dataset preparation and implementing the MobileNetV2 model for the face mask detection project.
- Collected, organized, and preprocessed the dataset, including tasks such as resizing images, normalization, and balancing class distributions.
- Applied data augmentation techniques such as rotation, flipping, zooming, and shifting to enhance dataset diversity and improve model generalization.
- Built and fine-tuned the MobileNetV2 model using transfer learning, adapting it to the custom dataset.
- Unfroze selective layers of MobileNetV2 for fine-tuning, allowing the model to better specialize for face mask detection.
- Integrated BatchNormalization and Dropout during fine-tuning to stabilize learning and reduce overfitting.
- Compiled the model with the Adam optimizer and categorical cross-entropy loss, suitable for multi-class classification.
- Implemented callbacks such as EarlyStopping (patience of 10 epochs) and ReduceLROnPlateau to optimize training and prevent overfitting.
- Trained the MobileNetV2 model over 25 epochs while monitoring validation accuracy and loss after each epoch.
- Visualized training and validation curves to evaluate the model's learning behavior and detect overfitting patterns.
- Achieved fast convergence with MobileNetV2, resulting in a lightweight and efficient model suitable for real-time face mask detection.
- Documented all dataset preparation steps, data augmentation methods, model architecture modifications, training process, and evaluation results in the project report.

Report Contribution

- I contributed to the report by documenting the entire process of dataset preparation, including the details of how the dataset was collected, organized, and preprocessed.
- Described the data augmentation techniques used, explaining how each method (rotation, flipping, zooming, and shifting) helped improve the model's generalization.
- Detailed the process of building and fine-tuning the MobileNetV2 model, including the architecture modifications and rationale for adapting the model to the specific face mask detection task.
- Explained the significance of selectively unfreezing layers of MobileNetV2 for fine-tuning and how this strategy allowed the model to specialize for the given task.
- Documented the regularization techniques applied, such as BatchNormalization and Dropout, and provided explanations on how they stabilize the learning process and reduce overfitting.
- Included the compilation process, highlighting the choice of the Adam optimizer and categorical cross-entropy loss for multi-class classification.
- Added a section describing the implemented callbacks, including EarlyStopping and ReduceLROnPlateau, and their roles in optimizing the training process.
- Provided an overview of the training process, emphasizing the training duration (25 epochs) and monitoring the model's performance with validation accuracy and loss.
- Included visualizations of the training and validation curves to analyze the model's learning behavior and detect signs of overfitting.
- Highlighted the key achievement of fast convergence with MobileNetV2 and its suitability for real-time face mask detection applications.
- Ensured that all steps, from dataset preparation to training, were thoroughly documented and the results presented clearly in the report.