

# Performance Comparison of Neural Network Models on Edge Devices Using Face Mask Detection System

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**Abstract** - COVID-19 pandemic has affected the humanlifestyle in an unprecedented way. Apart from vaccination, one of the best precautionary measures is wearing masks in public. Face Mask detection models that are deployable on single boardcomputers (SBC) enable data security, low latency, and low costin the real-world deployment of face mask detection systems. Offline deployment is possible on SBC as data is referenced on the device compared to a server implementation while securingmonitored individuals' privacy. Thus, this paper aims to implement an autonomous vision system that is deployed on Raspberry Pi devices to detect face masks in real-time. Performances of MobileNet, MobileNetV2, and EfficientNet Convolutional Neural Network (CNN) architectures were compared in both standard hardware and edge devices. We used the TensorflowLite format to compress the model for deployment. Accuracy, precision, and recall were used as metrics to compare the model performance. MobileNet achievedthe overall best test accuracy of 97.93% while MobilNetV2attained 96.12% ranking second. Each model's average inference times for standard hardware and a raspberry pi 4 device were measured by connecting to a camera feed.MobileNetV2 outperformed the other two models in inference time on the Raspberry pi device.

**Keywords** - Convolution Neural Network Architectures, COVID-19, face mask detection, Raspberry pi