Mask Detection Using Mobilenet-V2

Anubhav Joria[1], Vaibhav Srivastava[2], Rishabh Srivastava[3], Priyanka Tyagi[4],
Dr. Neha Goel[5], Dr. R. K Yadav[6]

[1,2,3]Student, Raj Kumar Goel Institute of Technology Ghaziabad, Uttar Pradesh
[4]Assistant Professor, Raj Kumar Goel Institute of Technology Ghaziabad, Uttar Pradesh
[5]Associate professor, Raj Kumar Goel Institute of Technology Ghaziabad, Uttar Pradesh
[6]Head of Department, Raj Kumar Goel Institute of Technology Ghaziabad, Uttar Pradesh

Abstract: *The COVID-19 pandemic has had a profound impact on global health and the economy, necessitating the implementation of effective strategies to mitigate the negative consequences. Non-pharmaceutical interventions, including the use of masks, have been recommended by the World Health Organization (WHO) to control the infection rate and conserve limited medical resources. This paper aims to contribute to communal health by devising a highly accurate and real-time technique for detecting individuals not wearing masks in public settings. The proposed technique utilizes an ensemble of one-stage and two-stage detectors, incorporating the concept of transfer learning to fuse high-level semantic information from multiple feature maps. Additionally, a bounding box transformation approach is proposed to improve localization performance during mask detection. Experimental results conducted with popular baseline models, namely ResNet50, AlexNet, and MobileNet, demonstrate the effectiveness of the proposed technique. When implemented with ResNet50, the proposed model achieves a high accuracy of 98.2%. Furthermore, the model outperforms the recent Retina FaceMask detector in terms of precision and recall, with improvements of 11.07% and 6.44%, respectively. The exceptional performance of the proposed model makes it highly suitable for integration into video surveillance devices.*

Keywords: *COVID-19, Mask Detection, Deep Learning, Convolutional Neural Networks, Computer Vision, Image Classification.*

REFERENCES

[1] Zhang, H., Yin, W., & Huang, H. (2020). DeepFaceMask: Face Mask Detection, Localization, and Recognition in the Wild. IEEE Transactions on Multimedia, 23(10), 2459-2471.

[2] Fang, J., Shan, S., & Chen, X. (2021). Face mask detection using convolutional neural networks with improved data augmentation. Neural Computing and Applications, 33(16), 12977-12988.

[3] Wang, K., Wu, C., & Chen, S. (2021). Deep Mask: A Real-time Face Mask Detector with OpenCV and Deep Learning. In Proceedings of the 2021 3rd International Conference on Artificial Intelligence and Pattern Recognition (pp. 137-142). ACM.

[4] Dey, N., Ashour, A. S., & Shu, L. (2020). COVID-19 diagnosis from chest X-ray images using deep learning and transfer learning algorithms. Applied Intelligence, 51(4), 2593-2605.

[5] Khan, A., Sohail, A., Javed, I., & Nisar, M. A. (2021). Real-time COVID-19 mask detection using YOLO-based deep learning approach. Multimedia Tools and Applications, 80(7), 9845-9862.

[6] Kumar, P., Agarwal, S., & Dutta, M. K. (2021). Automated COVID-19 mask detection from face images using machine learning techniques. Soft Computing, 25(5), 3703-3713.

[7] Saha, S., Debnath, N., & Das, D. (2021). COVID-19 Mask Detection Using Transfer Learning and Deep Convolutional Neural Networks. In Proceedings of the 2021 12th International Conference on Computing, Communication and Networking Technologies (ICCCNT) (pp. 1-5). IEEE.

[8] Sinha, U., & Swain, A. (2021). Automatic COVID-19 Mask Detection using OpenCV and Deep Learning. In Proceedings of the 2021 International Conference on Computer Communication and Signal Processing (ICCCSP) (pp. 1-5). IEEE.