

Real-Time Face Mask Detection Using Cascaded Bilevel Feature Extraction Techniques for Access Restriction in Public Buildings

Enobong Thomas Adahada
Department of Computer Science
Federal University of
Technology, Minna
Minna, Nigeria
adahadapato@gmail.com

Solomon Adelowo Adepoju
Department of Computer Science
Federal University of
Technology, Minna
Minna, Nigeria
solo.adepoju@futminna.edu.ng

Abdulmalik Danlami Mohammed
Department of Computer Science
Federal University of
Technology, Minna
Minna, Nigeria
drmalik@futminna.edu.ng

Opeyemi Aderiike Abisoye
Department of Computer Science
Federal University of
Technology, Minna
Minna, Nigeria
o.abisoye@futminna.edu.ng

Abstract—COVID-19's fast spread has caused widespread devastation and afflicted millions of individuals across the globe. Since COVID-19 has no known treatment, wearing masks has proven to be one of the most successful methods of avoiding transmission and is now required in most public areas, raising need for programmed real-time mask detection devices to substitute manual reminders. Face mask detection necessitates a large amount of data to be processed in real-time with limited processing resources, therefore local descriptors that are fast to calculate, fast to match, and storage economical are in high demand. This research proposes a cascade of Features

from Accelerated Segment Test (FAST) corner detector and Histogram of Oriented Gradient (HOG) feature descriptor to hasten matching and decrease memory consumption and computational complexity. The proposed method attained an improved accuracy of 99.41% than the previous work, which reached 99.27% and 95%. Additionally, the proposed system extracted the face features for training and testing in 48 seconds. This result demonstrated that the proposed approach is appropriate for real-time face mask detection.

Keywords—Cascaded Bi-level, Covid-19, Face Mask, Face Mask Detection, Feature Extraction