

Face-recognition software that lifts the veil

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Face-recognition technology is advancing apace and has applications in security and biometrics, marketing, education, criminal investigation, and many other areas. It can now not only recognize the person but can ascertain the expression on their face. Research in the *International Journal of Biometrics* tackles the limitations of face recognition software

when the person's face is partly obscured, by a veil or protective face mask, for instance.

The researchers, based in Hungary, Jordan, Saudi Arabia, the U.K. and the U.S. report a facial recognition accuracy with their deep-learning approach that is 99.95% accurate for facial recognition even for a person wearing a niqab, which covers most of the face except the eyes. The software is 99.9% accurate for gender recognition and determination of age. It can recognize whether a veiled person or person wearing a COVID mask is or is not smiling, by analyzing the eyes, with 80.9% accuracy. Tests were carried out on an image database of 150 people, 41 male and 109 female subjects aged from 8 to 78 years old.

Ahmad B.A. Hassanat of Mutah University in Karak and Abeer Ahmad Albustanji of the Ministry of Environment in Amman, Jordan, Ahmad S. Tarawneh of Eotvos Lorand University in Budapest, Hungary, Malek Alrashidi, Mansoor Alghamdi, and Ibrahim S. Alkhazi of the University of Tabuk, Hani Alharbi of the Islamic University of Madinah, Saudi Arabia, Mohammed Alanazi of Cranfield University, U.K., and V.B. Surya Prasath of the University of Cincinnati, Ohio, U.S., used a deep convolutional neural network to develop their recognition system. The [neural network](#) has 4,096 features in each layer of the recognition process.

The team points out that their proof of principle—known as DeepVeil—involved the use of an in-house image database, with face-on images of veiled persons taken at close range. The next step will be to work with a more diverse set of images recorded in a range of settings including photos taken from different angles. That said, in the early days of conventional [facial recognition](#) systems, a clear face-on image was needed to verify a person's identity, but that is no longer the case as the algorithms and software have evolved. So, the same will, with the right approach and further development, likely become true for DeepVeil.

More information: V.B. Surya Prasath et al, DeepVeil: deep learning for identification of face, gender, expression recognition under veiled conditions, *International Journal of Biometrics* (2022). [DOI: 10.1504/IJBM.2022.10048981](https://doi.org/10.1504/IJBM.2022.10048981)

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