# A facial recognition system is a computer application capable of identifying or verifying a person from a digital image or a video frame from a video source.

Some face recognition algorithms identify facial features by extracting landmarks, or features, from an image of the subject's face. For example,an algorithm may analyze the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw.

These features are then used to search for other images with matching features

Recognition algorithms can be divided into two main approaches, geometric, which looks at distinguishing features,or photometric,which is a statistical approach that distills an image into values and compares the values with templates to eliminate variances.

Three-dimensional face recognition technique uses 3D sensors to capture information about the shape of a face. This information is then used to identify distinctive features on the surface of a face, such as the contour of the eye sockets, nose, and chin.

One advantage of 3D face recognition is that it is not affected by changes in lighting like other techniques. It can also identify a face from a range of viewing angles, including a profile view. Three-dimensional data points from a face vastly improve the precision of face recognition.

3D research is enhanced by the development of sophisticated sensors that do a better job of capturing 3D face imagery.

In the 2000 Mexican presidential election, the Mexican government employed face recognition software to prevent voter fraud. Some individuals had been registering to vote under several different names, in an attempt to place multiple votes. By comparing new face images to those

already in the voter database, authorities were able to reduce duplicate registrations.

Similar technologies are being used in the United States to prevent people from obtaining fake identification cards and driver’s licenses.

Face recognition is less effective if facial expressions vary. A big smile can render the system less effective. For instance: Canada, in 2009, allowed only neutral facial expressions in passport photos.

This fundamentally changes the dynamic of day-to-day privacy by enabling any marketer, government agency, or random stranger to secretly collect the identities and associated personal information of any individual captured by the face recognition system.

By about 1997, the system developed by Christoph von der Malsburg and graduate students of the University of Bochum in Germany and the University of Southern California in the United States outperformed most systems with those of Massachusetts Institute of Technology and the University of Maryland rated next. The Bochum system was developed through funding by the United States Army Research Laboratory. The software was sold as ZN-Face and used by customers such as Deutsche Bank and operators of airports and other busy locations.

The software was "robust enough to make identifications from less-than-perfect face views. It can also often see through such impediments to identification as mustaches, beards, changed hair styles and glasses—even sunglasses".

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