# Step right up, let the computer look at your face and tell you your age

September 23 2008

People who hope to keep their age a secret won't want to go near a computer running this software. Like an age-guesser at a carnival, computer software being developed at the University of Illinois can fairly accurately estimate a person's age. But, unlike age-guessers, who can view a person's body, the software works by examining only the person's face.

"Age-estimation software is useful in applications where you don't need to specifically identify someone, such as a government employee, but would like to know their age," said Thomas S. Huang, the William L. Everitt Distinguished Professor of Electrical and Computer Engineering at the U. of I.

For example, age-recognition algorithms could stop underage drinkers from entering bars, prevent minors from purchasing tobacco products from vending machines, and deny children access to adult Web sites, said Huang, who leads the Image Formation and Processing group at the university's Beckman Institute.

Estimating someone's age is not an easy task, even for a computer. That's partly because the aging process is determined not only by a person's genetic makeup, but by many other factors as well, including health, location and living conditions.

"Human faces do convey a significant amount of information, however, and provide important visual cues for estimating age," Huang said.

"Facial attributes, such as expression, gender and ethnic origin, play a crucial role in our image analysis."

Consisting of three modules – face detection, discriminative manifold learning, and multiple linear regression – the researchers' age-estimation software was trained on a database containing photos of 1,600 faces.

The software can estimate ages from 1 year to 93 years. The software's accuracy ranges from about 50 percent when estimating ages to within 5 years, to more than 80 percent when estimating ages to within 10 years. The accuracy can be improved by additional training on larger databases of faces, Huang said.

In addition to performing tasks such as security control and surveillance monitoring, age-estimation software also could be used for electronic customer relationship management.

For example, a camera snapping photos of customers could collect demographic data – such as how many adult men and women buy burgers, or what percentage of teenagers purchase a particular soft drink.

Or, combined with algorithms that identify a person's sex, age-estimation software could help target specific audiences for specific advertisements. For example, a store display might advertise a new automobile or boat as a man walks by, or new clothing or cosmetics as a woman walks by.

"All of this can be done without violating anyone's privacy," Huang said. "Our software does not identify specific individuals. It just estimates their ages."

The researchers published their findings in the two journals IEEE Transactions on Multimedia and IEEE Transactions on Image Processing

in 2008.

Source: University of Illinois at Urbana-Champaign