

Artificial intelligence: Getting better at the age guessing game

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Scientists are developing artificial intelligence solutions for image processing, which have applications in many areas including advertising, entertainment, education and healthcare. They have, for example, developed computer algorithms for facial age classification - the automated assignment of individuals to predefined age groups based on their facial features as seen on video captures or still images.

Improving the accuracy of facial [age](#) classification, however, is not easy. A person can teach a computer to make better guesses by running its algorithm through a large database of facial images of which the age is known using sets of labeled images, but acquiring such a database can be both time-consuming and expensive. The process might even breach privacy in certain countries. Jian-Gang Wang at the A*STAR Institution for Infocomm Research and co-workers have now developed an algorithm called incremental bilateral two-dimensional linear discriminant analysis (IB2DLDA) that could overcome such problems.

The researchers designed IB2DLDA so that it actively 'learns'. The algorithm first processes a small pool of labeled images, and then iteratively

selects the most informative samples from a large pool of unlabeled images to query the user, and the information is added to the training database. According to Wang, unlabeled [images](#) that are markedly different to the labeled samples are the most informative. The 'active learning' approach significantly improves the efficiency of the algorithm and reduces the number of samples that need to be labeled, and hence the time and effort required to program the computer.

Based on their new findings, the researchers hope that it will become easier to build facial age classification into intelligent machines. The technology could find use, for example, in digital signage where the machine determines the age group of the viewer and displays targeted advertisements designed for those age groups, or in interactive games where the machine automatically presents different games based on the players' age range. Wang adds, "A vending machine that can estimate the age of a buyer could be useful for products that involve age control, such as alcoholic drinks and cigarettes."

The researchers demonstrated that the active learning approach was much faster than random selection, and used only half the number of samples. The method is also suitable for handling problems with a large number of classes, and could one day be generalized to applications other than age estimation. "We are now planning to extend our method to other areas such as classifying human emotions and actions," says Wang.

More information: Research article in [IEEE Transactions on Image Processing](#)

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