

# Technology



## Barcode worth a thousand words

**WE DISCUSSED HOW** 2D barcodes work here last time. They are not appealing visually and if people find decoding them boring, it may largely reduce the effectiveness of the mobile advertisement campaign.

At the Hong Kong University of Science and Technology a barcode development team consisting of both undergraduate and postgraduate students, led by me, has been set up to tackle these challenges.

By developing coding and signal-processing methods to automatically embed a generic picture into a 2D barcode, almost the whole barcode area can be used to show the image.

This novel picture-embedding barcode, called PiCode, enables the embedded brand logo to be easily recognized and gets rid of the need to distort the logo in order to fit it into a small area.

In addition, PiCode shows the embedded

picture with some artistic effect induced by the specific form of mosaic patterns used, and it has a better aesthetic appearance than existing barcodes.

Needless to say, a well-designed brand image and the associated spirit or culture it represents is valuable to a business, and it is expensive to maintain.

PiCode manages to preserve the valuable image represented by the brand logo, while taking full advantage of ubiquitous barcode-based mobile advertisements.

It is designed to attract more attention from potential customers.

In addition to embedding a logo, PiCode offers the option of optimizing appearances when the embedded picture represents a human face.

It shows a recognizable embedded picture of a face with an eye-catching cartoonish look. This



face feature not only allows a person to be the subject of a mobile advert but also opens up new potential applications in which PiCode may be used like a conventional photo ID card.

This may be a valuable feature that allows preliminary user authentication in the



**Mow Wai-ho**

implementation of a secure barcode-based mobile payment system.

It is likely that people will be presented with more and more barcodes, but this time they may carry fun pictures, and the technology behind them may have originated from Hong Kong.

At present, PiCode is decodable only by smartphones equipped with a specially designed barcode app developed by the HKUST team.

But a demonstration website [www.PiCode.info](http://www.PiCode.info) has been set up to showcase the new barcoding technology. Using a smartphone's mobile browser, it can be conveniently applied to decode a snapshot of the provided PiCode examples.

• Mow Wai-ho is an associate professor in the Department of Electronic and Computer Engineering, School of Engineering, Hong Kong University of Science and Technology