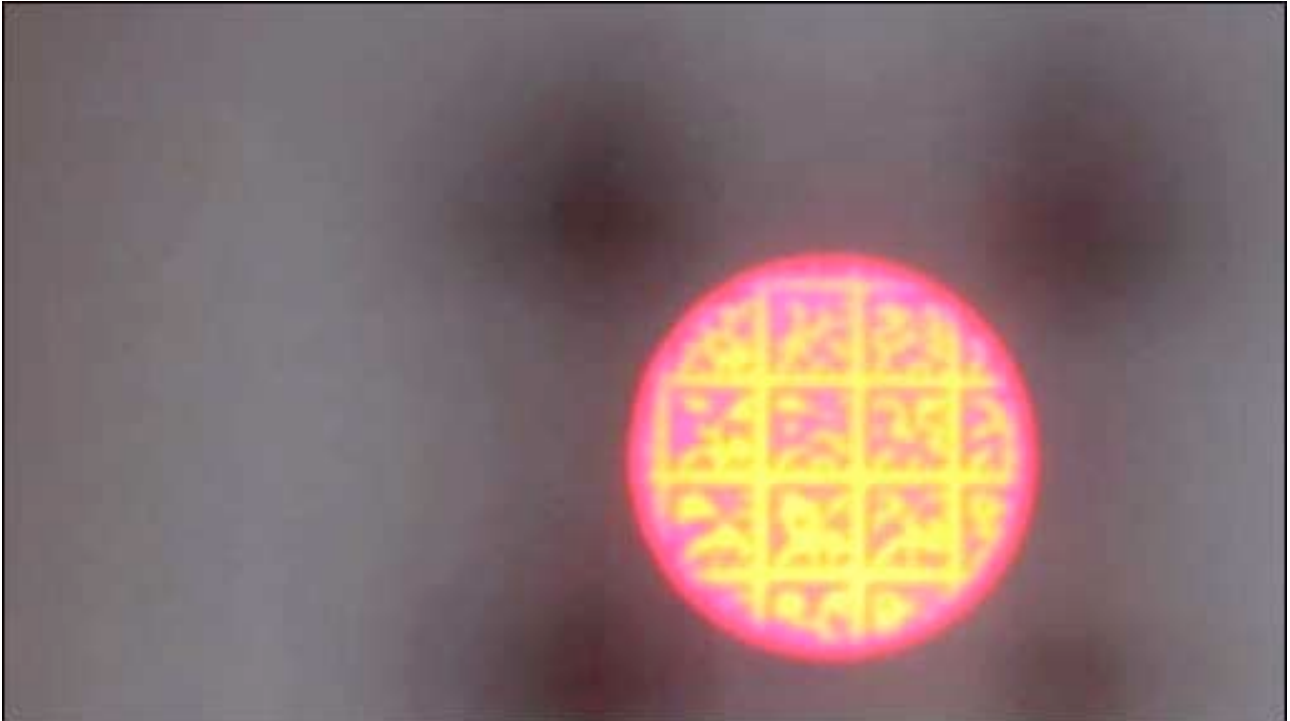


# Barcode replacement shown off

By Jonathan Fildes  
Technology reporter, BBC News



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Could tiny tags replace barcodes?

**A replacement for the black and white stripes of the traditional barcode has been outlined by US researchers.** Bokodes, as they are known, can hold thousands of times more information than their striped cousins and can be read by a standard mobile phone camera.

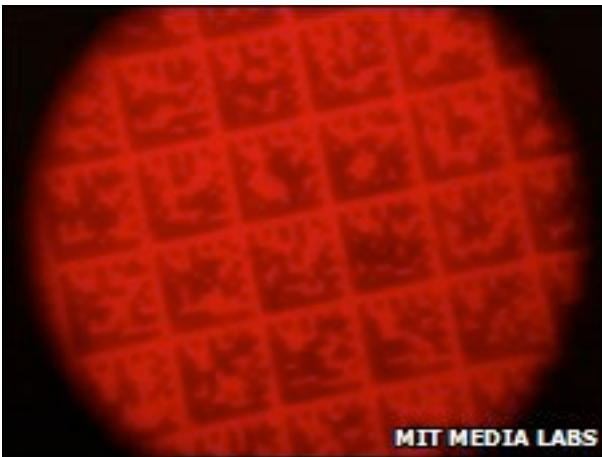
The 3mm-diameter (0.1 inches), powered tags could be used to encode nutrition information on food packaging or create new devices for playing video games.

The work will be shown off at Siggraph, a conference in New Orleans next week.

"We think that our technology will create a new way of tagging," Dr Ankit Mohan, one of the Massachusetts Institute of Technology (MIT) researchers behind the work, told BBC News.

## **Distant reader**

The Bokodes currently consist of an LED, covered with a tiny mask and a lens. Information is encoded in the light shining through the mask, which varies in brightness depending on which angle it is seen from.



Bokodes use light to encode information

"It is either bright or dark depending on how we want to encode the information," said Dr Mohan, who works for the MIT Media Lab Camera Culture group.

The researchers believe the system has many advantages over conventional barcodes. For example, they say, the tags are smaller, can be read from different angles and can be interrogated from far away by a standard mobile phone camera.

"For traditional barcodes you need to be a foot away from it at most," said Dr Mohan.

The team has shown its barcodes can be read from a distance of up to 4m (12ft), although they should theoretically work up to 20m (60ft).

"One way of thinking about it is a long-distance barcode."

Initially, said Dr Mohan, the Bokodes may be used in factories or industrial settings to keep track of objects.

### 'Look at me'

However, the team also thinks they could be used in consumer applications, such as supermarkets, where products could be interrogated with a shopper's mobile phone. For example, they could be used to encode nutritional information or pricing offers.

"One to the side may say 'hey, look at me, I'm a dollar cheaper'," said Dr Mohan.

Taking a picture would also allow people to compare lots of different products quickly. A similar system could be used in a library, said Dr Mohan.



Bokodes (centre) are much smaller than traditional barcodes

"Let's say you're standing in a library with 20 shelves in front of you and thousands of books."

"You could take a picture and you'd immediately know where the book you're looking for is."

And the team also believes the tags could find their way into places not normally associated with traditional barcodes.

For example, the system's ability to read angular information could allow its use in motion-capture systems used to create videogames or films.

Dr Mohan said they could also be used to augment the information incorporated into Google Streetview, a service which allows users to browse a selection of pictures taken along city streets.

At the moment, the images for Streetview - accessible through Google Maps - are collected by trucks and cars fitted with several cameras.

"Shop and restaurant owners can put these Bokodes outside their stores and as the Google truck is driving down the street it will capture the information in that."

For example, a restaurant could put menu information inside the tag.

When the data is uploaded to Google Maps, it would automatically be displayed next to the image of the restaurant, said Dr Mohan.

### **Colour code**

Currently, the tags are expensive to produce - around \$5 (£3) each. This is, in part, because the early prototypes require a lens and a powered LED.

However, the researchers believe the technology could be refined so that tags were reflective and require no power.

"We already have prototypes which are completely passive," said Dr Mohan.

In this form, they could cost around 5 cents each, he added.

It is not the first time that companies or researchers have suggested replacements for, or enhancements to, barcodes.

For example, in 2007 Microsoft launched its High Capacity Colour Barcode, a series of coloured geometric patterns.

Radio Frequency Identification (RFID) technology - essentially tiny electronic tags that broadcast encoded information - were also touted as a barcode replacement.

Although they are now used in many applications, such as library books, passports and travel passes, RFIDs have yet to displace the familiar black and white stripes of the barcode.