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Blind people to 'see' colour by touch

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ABC Science Online

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Blind people may be able to 'see' images created by a computer program that translates colour images into textured graphics, according to a Polish researcher.

The research was published on the physics website [arXiv](#), which is owned and operated by [Cornell University](#) in Ithaca, New York.

The computer program by Artur Rataj, from the Institute of Theoretical and Applied Computer Science at the [Polish Academy of Sciences](#), is said to be the first to put colour into tactile graphics, images that blind people can 'read' by touch.

There are several ways of translating images for blind people in the same way writing is translated into braille.

One way uses braille dots spaced closely together. Another uses vacuum-treated plastic wrapped over 3-D sculptures of the image. But the vacuum-treated plastic method is expensive and time-consuming.

Images can also be made into tactile graphics, which use raised lines and dashes to represent a picture. Using fingers, visually impaired or blind people can get a feel for the details of images. Until now, these had been in black and white.

Now in colour

But a computer could assign different textures to colours, Rataj said. His program detects the edge of objects in the image and then assigns a primary colour to different parts of the image.

Each colour is represented by rows of dashes at different angles. For example, yellow is represented by rows of vertical dots and blue by rows of horizontal dots. Colour is simplified so there is only one blue, not shades of light or dark blue.



Using a computer to translate colourful images into tactile graphics may help blind people 'see' pictures

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Combination colours, like orange, are made by using dashes angled at a direction halfway between red and yellow. The intensity of the colour depends on the density of the raised dashes. More dashes mean brighter colours.

Identifying the colours in an image may help people recognise the image, Rataj said, who is testing his method with blind people.

Australian Tim Connell is managing director of the Sydney-based company Quantum Technology, which supplies a printer that translates images into tactile graphics.

Connell told *ABC Science Online* that although Rataj's work had some value, it was easy to add too much complexity to a graphic.

"Too much information means it's difficult to understand the picture," he said. "Less is more."

He also said that people who have been blind for life found colour meaningless.

"If colour adds meaning it's important. Otherwise it's simply aesthetic and not practical."

Connell said that colour textures had been used before in tactile graphics but not by computers. He said using a computer "adds some value but is not a solution" to producing tactile graphics.

"As Rataj admits, human translators still make a better picture."

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