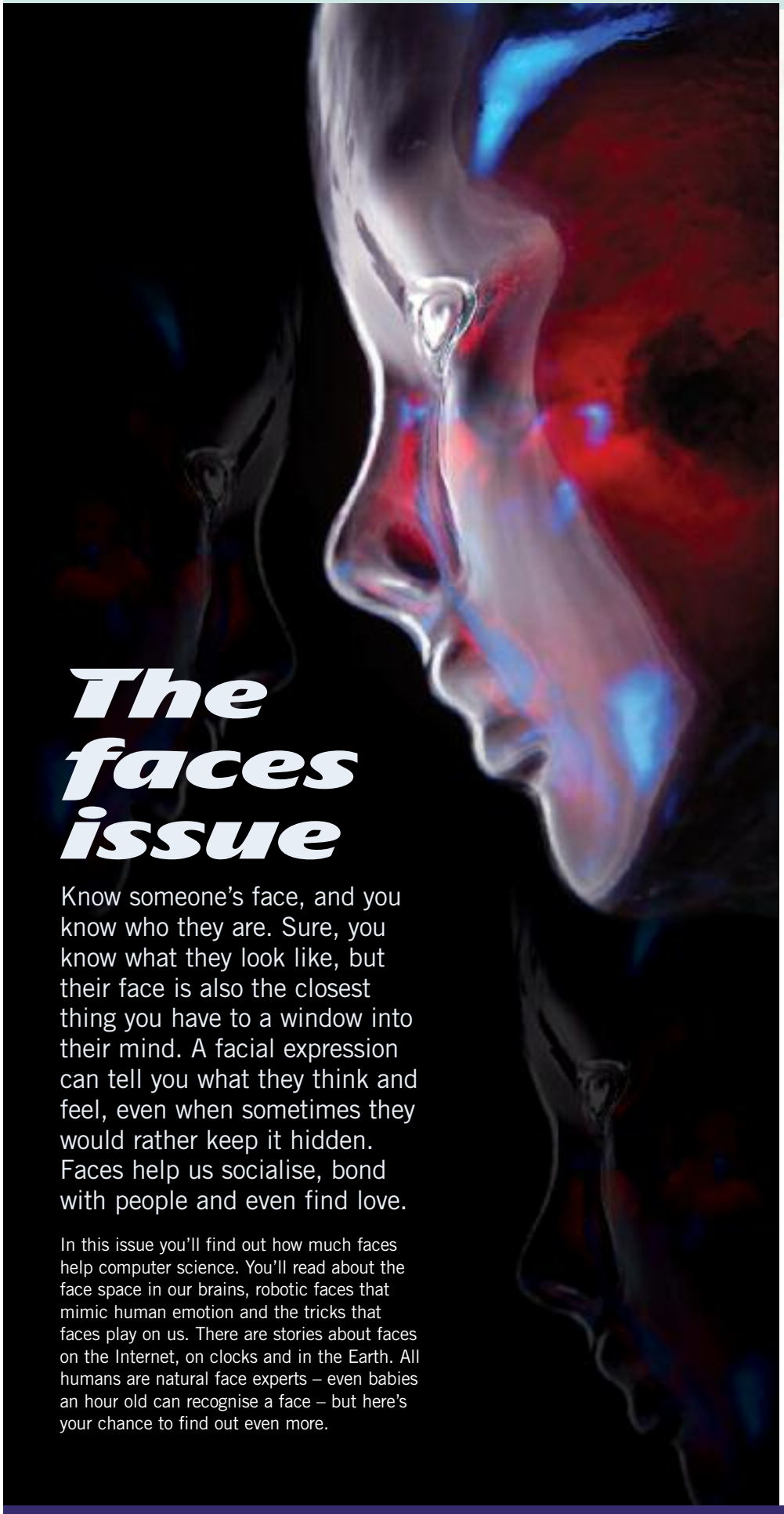

The faces issue

Know someone's face, and you know who they are. Sure, you know what they look like, but their face is also the closest thing you have to a window into their mind. A facial expression can tell you what they think and feel, even when sometimes they would rather keep it hidden. Faces help us socialise, bond with people and even find love.

In this issue you'll find out how much faces help computer science. You'll read about the face space in our brains, robotic faces that mimic human emotion and the tricks that faces play on us. There are stories about faces on the Internet, on clocks and in the Earth. All humans are natural face experts – even babies an hour old can recognise a face – but here's your chance to find out even more.

Fingers feeling focus

People with visual impairments use interfaces to get online that don't rely on sight. For example, instead of reading text printed on a screen, screen readers can turn text on a webpage into speech. That works OK, but sometimes the methods for images can be a bit indirect, like relying on wordy descriptions of what's in a picture. But now researchers in the USA have come up with a way for people with visual impairment to get more out of images – they have a method for automatically turning photos of faces into raised pictures that people can feel with their fingers.

The computer program concerned, TactileFace, first needs a portrait photo. Once it detects where in the photo the face is, it sets about redrawing the various features. The tough bit is that people can't feel as much detail with their fingers as they can see with eyes, so the raised portraits need to be simpler than the original photos. To do this the computer needs to know which important lines to keep, and which details it can discard. Luckily, it's been trained to know the big landmarks of a face, like the eyes, nose and mouth. It can then detect line edges in the rest of the face, ending up with a face that's got a reasonable amount of detail without being too much to handle.

Finally, the portrait goes to a printer, where it's printed on to special paper that swells when it's exposed to the heat of the print head. A person with a visual impairment can then feel the face to find out what a person looks like. The researchers tested their system with a range of people, and it works well – folk were good at locating facial features, could figure out the pose the picture was taken in, and could even pick out two different pictures of the same person from a group. Feels like they've found a good solution!