Zoe – Cambridge's emotional talking head

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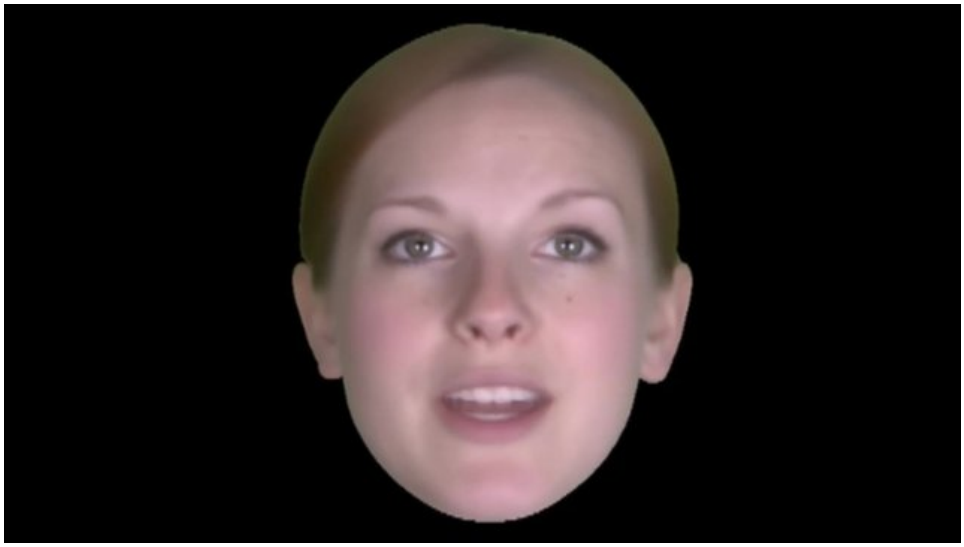

Rory Cellan-Jones finds out how Zoe works

In a laboratory in Cambridge, I'm having a conversation with Zoe. At first she says she is "so pleased to see me" but later she gets angry: "I've had just about enough of this," she tells me, "You've been messing me about all morning."

Mind you, it is my fault - I made her angry by adjusting a slider on a computer screen. Because Zoe is a virtual talking head created in a collaboration between Cambridge University's Engineering Department and the Toshiba Research Laboratory. Her genesis tells you something about the way business and academics are working together in the UK's leading hi-tech cluster.

There is a lot of work on virtual heads, or avatars, at the moment - you can even use Microsoft's Xbox Kinect system to create a virtual you to put in a game. But the team behind Zoe believe they have gone a step further by giving Zoe a range of human emotions expressed in her face and voice.

The face is that of Zoe Lister, the actress who played Zoe Carpenter in Channel 4's Hollyoaks, and the scientists spent some days recording her facial and vocal expressions. They then built a lightweight piece of software which allows users to input any text and then adjust to have it spoken in various moods, from happy to frightened to angry.

The project draws on expertise in speech recognition and in computer vision - ways of capturing visual data - which have been a strength of Cambridge and the Toshiba lab in particular. It has been led by Professor Roberto Cipolla, who splits his time between the Department of Engineering in the centre of Cambridge and the Toshiba laboratory on the Science Park.

Professor Cipolla says Zoe is "the interface of the future", part of a trend towards abandoning the keyboard and mouse and finding new ways of relating to computers.

To my eye, Zoe was stuck somewhere in the "uncanny valley", that no man's land between robot and realistic human replica that makes us feel uncomfortable. But she is still a work in progress, and the Toshiba/Cambridge team say they are confident that she will become far more realistic.

They are particularly proud that the program they've built is so small, making it feasible to load it easily onto a smartphone or tablet. But what is it for?

Dr Bjorn Stenger, once one of Professor Cipolla's doctoral students and now employed at the Toshiba lab, sees a number of uses: "Sending messages to your friends with your face on it," he suggests. Virtual actors or game characters are another possibility - and then there is the prospect of virtual carers or call centre employees.

There is no guarantee that "Zoe" will be commercialised, or that her inventors will profit from her. The Toshiba Lab is focussed on long-term research rather than being an incubator for start-up companies.

But what always impresses me about Cambridge is the sense that all kinds of bridges are now being built between world-class science in the university and the commercial world. The result is that some of Britain's most valuable technology businesses are continuing to emerge from Silicon Fen. That is rather a contrast with London's Tech City, which has yet to build strong links to the capital's excellent universities.

And while major international technology companies are now opening offices in East London, they are still looking to Cambridge for ideas and people. Professor Cipolla told me that one of his biggest concerns these days was that his smartest graduate students were being lured away by big money offers from the likes of Google, Facebook and Microsoft.

But some of the brightest and best are staying and building companies. As long as ideas like the digital talking head are emerging from Cambridge labs, its scientists are going to be a valuable resource for our economy.