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HEADLINE: 'To speak to an operator, start swearing now': TELECOMMUNICATIONS: New software may rescue callers trapped in automated phone systems by sensing when they begin to get angry, writes Rhymer Rigby:

BYLINE: By RHYMER RIGBY

BODY:

Who among us has not experienced the frustration of being trapped in an automated phone system?

You have spent 15 minutes mouthing numbers like a robot as you go through the various options, only to realise - usually with the end in sight - that you made the wrong choice several steps back. Your voice rises, the profanities start flowing and then, just as you are about to slam the receiver down, a real person says: "Sorry about the problems you've been experiencing. How may I help you?"

This may sound like a dream come true for victims of automated telephony. But technology that recognises when callers are angry and transfers them to an operator is already under development. Researchers at the **University of Southern California** are working on software that listens not just to what callers are saying but also to how they say it.

Shrikanth Narayanan, USC's professor of electrical engineering, computer science and linguistics, explains: "In spoken language, the speech signal conveys a lot of information about emotion. The energy of the signal is one cue, the speech rate is another cue and there's also lexical information such as swear words. Then there are patterns of interaction that deviate from the norm, and so on."

The software combines the information from these sources and determines whether the caller is likely to be angry. He or she can then be transferred to someone who can deal with it.

Prof Narayanan and his team used 1,400 recorded conversations from an airline's call centre to teach the system to sniff out phone rage and, although it is early days yet, he says accuracy is between 80 and 85 per cent, with the remainder split between false positives and false negatives. Moreover, the software has the ability to learn on the job: the more it is used, the better it becomes.

The business relevance, he says, is clear. If someone becomes sufficiently frustrated, a company may lose a customer. Deal with their frustration successfully and you are more likely to retain them, although this need not be by diverting them to an (expensive) real person.

Martin Barry, a lecturer in phonetics at Manchester University, says that the idea has potential. "It seems like a fairly straightforward task, the parameters are relatively manageable - and it's a really good application of this thinking." Though he cautions that there could be problems.

The system, he says, might have difficulty with some regional accents. One of the information sources it looks at is the range of pitch - people's voices tend to get squeakier as they get angrier. This could be a problem with certain accents, for example among people from Glasgow or in the north east of England, which have a wide natural range of pitch.

Mr Barry also cautions that people might abuse the system, swearing from the outset in order to get through to a real person.

Steven Feldman, interactive voice recognition self-service director at Avaya, the enterprise solutions company, says companies need to redesign their voice recognition systems to stop customers becoming angry in the first place. But he adds that, as many customers call these lines to complain, they may well be irate even before the system has a chance to annoy them.

"Even if you do everything right, you can still frustrate people," he says. "I'm very intrigued and interested by this technology because it means you can do something about this. If a customer is in an automated system and they're getting angry, you need to get them out."

Mr Feldman is concerned, however, that it may be hard for vendors to demonstrate the initial value to prospective buyers: "When you switch from real people to automated, the savings per call make it easy to justify. This may be more difficult. You might have to look at customer attrition rates and you'd need to do line testing and benchmarking. The proof of the pudding will be in whether businesses can be convinced to buy it."

Prof Narayanan says there are other applications for the technology, beyond call centres. He is already working with the US military on virtual reality training systems with an ability to gauge their users' emotional states.

Another is in children's educational toys - allowing devices to provide an appropriate response depending on whether the child is happy, miserable, frustrated or so on. Here, voice information could be combined with visual information (from a built-in camera) allowing a more accurate and sophisticated analysis.

Still, frustrated callers should not start intentionally abusing their phones just yet. Narayanan says it will be up to two years before the software is ready for market. In the meantime, the only thing that swearing at the receiver is going to accomplish is relieving your own feelings.

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