The talking cure

Speech technology: Good speech recognition requires a fast PC. A chip-based implementation could make the technology more portable

IF YOU have sausage-sized fingers, find pen-driven handheld computers a fiddle or have never got the hang of predictive text on your mobile phone, a new chip might provide a sympathetic ear. It is being devised by a team of researchers from Carnegie Mellon University and the University of California at Berkeley to do one thing, and one thing only: speech recognition. Using a new, hardware-based approach to the problem, the researchers hope to create a chip that performs speech recognition much more efficiently than is currently possible using software-based recognition systems. If they are right, it might soon become possible to dictate an e-mail into your BlackBerry, or edit your mobile phone's address book using voice commands alone.

Speech-recognition software has been on the market for over a decade, and in the past five years it has become advanced enough to displace keyboard entry, for some users at least. But speech-recognition packages such as IBM's ViaVoice and ScanSoft's Dragon NaturallySpeaking require a powerful desktop computer. Ask a portable device to do the same kind of computational heavy-lifting, however, and its battery will be flat within minutes. Why would a chip-only solution be any better?

The reason is simple: doing something in software is more flexible, but doing the

same thing with a dedicated chip consumes far less power. Computationally difficult tasks often start out in software, and are implemented in hardware later. "You do them in software first, because it's easier," says Rob Rutenbar, professor of electrical and computer engineering at Carnegie Mellon and the lead engineer on the "In Silico Vox" speech-chip project. "You redo them in hardware later to maximise their performance."

Computer graphics, for example, have already been through this transition from software to hardware. A few years ago, PCs would grind to a halt as they tried to render complicated graphics. This no longer happens today, because specialised graphics chips—from companies such as ATI and Nvidia—do the hard work. Bob Brodersen of the University of California, in Berkeley, has calculated that moving an application from a general-purpose software implementation to a specialised chip can improve efficiency by a factor of 10,000 (the efficiency metric being millions of calculations per milliwatt of power consumed).

The researchers were recently awarded a \$1m grant by America's National Science Foundation to develop their speech chip. The grant was made on the basis that a speech-recognition chip would have applications in homeland security. But what starts out as government or military technology often ends up in commercial applications, as packet-switched networks and the global-positioning system demonstrate.

Besides doing away with the need to use fiddly controls on handheld computers, mobile phones and music players, a speech-recognition chip would have other uses too: it could form the basis of a powerful, portable interpreting device, for example, or allow car drivers to change radio stations or operate navigation systems by speech alone.

Encapsulating the latest speech-recognition in hardware will not be easy, but the Carnegie Mellon researchers have the appropriate experience. They helped to develop much of today's successful speech-recognition technology, including the "Sphinx" software that forms the basis for many commercial speech-recognition systems and was developed with funding from the Defence Advanced Research Projects Agency (DARPA). The researchers hope to have a working prototype within two years.

Even so, fiddly keypads are not going away any time soon. You cannot use a speech-driven device to make a note while talking on the phone, for example, or to send a surreptitious text message during a boring meeting. Despite being small and annoying, keypads will persist. But for the less dextrous, the new chips cannot come soon enough. ■

A wider choice of software

Software: A new kiosk-based approach to selling software on the high street makes obscure but useful titles available to a far larger market

A CHAIN of high-street shops that sell software—isn't that a step backwards? Doesn't the future lie in high-speed software downloads over broadband links, or the replacement of packaged software with constantly updated, web-based alternatives? Not according to Daniel Doll-Steinberg. He is the founder of SoftWide, a company that is promoting a new way to sell software: from kiosks that produce disks and packaging, on demand, inside high-street shops. Is he mad—or might he have discovered a vast untapped market?

Mr Doll-Steinberg originally set out to increase the range of software that could be sold in existing shops. With limited shelf space, most shops stock only a few dozen titles. So his firm, SoftWide, devised a kiosk-based system that can store thousands of pieces of software on a hard disk, burning a disk only when a customer wants to buy a particular title. The first kiosks were tested in WH Smith, a British retail chain, and in Fnac stores in France. But having some titles in boxes on the shelves, and others provided by kiosks, was confusing. So Mr Doll-Steinberg decided that SoftWide should open its own chain of shops. The first two opened in London in 2002, and have since been followed by three more.

The kiosk-based approach means that compared with other software retailers, SoftWide's shops sell an entirely different range of software to an entirely different type of customer. In computer superstores, 60% of software sold is games, and about 35% is business software. In SoftWide's stores, in contrast, 50% of the software sold is educational and reference software (much of which is otherwise only available by mail order), 30% is business software and only 20% games. More than half of SoftWide's customers are women, and many are pensioners.

SoftWide's unusual model has a number of benefits over superstores and online downloads, Mr Doll-Steinberg insists. It makes it possible to offer customers advice, which is hard to come by in big superstores where shelves must be kept stocked. Users feel more comfortable with physical disks than with downloads, which can go wrong, cannot be resold, and are unsuitable as gifts. And