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Translation systems

Speak up
Jun 25th 2008
From Economist.com

Devices and programs are getting better at translating languages

SRI

Overcoming speech impediments

WARS often boost technological development. In Iraq the armed forces have faced a shortage of translators, both from within their own ranks and from bilingual locals whose lives can be put in peril if they are found to be working for the foreigners. This has created a demand for machines that can translate between Arabic and English. Although some experimental devices have proved unreliable, they are now improving.

A number of two-way translating devices have been under development as part of the Spoken Language Communication and Translation System for Tactical Use (TRANSTAC) programme run by the Defence Advanced Research Projects Agency, known as DARPA. There are three main participants: IBM, BBN Technologies and SRI International.

SRI said recently that it had sold 150 machines to the American government for use in Iraq. IBM has provided troops with 1,000 of its devices which run MASTOR, its multilingual automatic speech translator. Both systems can translate tens of thousands of words between Iraqi Arabic and American English, even when people are speaking outside the laboratory.

Yet Mari Maeda, who manages TRANSTAC, cautions that there is still a need for improvement. She thinks hardware has to become more rugged and that error rates need to fall from one word in six to one in ten. The names of people and places also remain difficult for the machines to grasp. Nevertheless, the progress that has been made is helping to extend use of the translation devices and systems.

One reason is that special hardware is not always necessary to run translation programs. SRI's Iraqcomm program operates on Windows XP and will work on some of the toughened-up notebook computers carried by soldiers and by foreign civilians. Like many language systems it uses statistical models to recognise speech patterns and sounds, in part to filter out sounds that are not speech and to predict the next word in a sentence. SRI also uses a database of known phrases to predict what people may say.

Such speech models are built by studying how people use language and how different people translate the same phrases. Once speech is "recognised", the Iraqcomm program uses several methods to try to translate it properly, applying logical rules to what has been said and checking phrases. Some systems can display a translated phrase as text onto a screen; others can also speak the words so that soldiers can hear the

translation as they look at the person they are talking too.

These two-way speech systems are a big step forward from the translation services used in some call centres. These probably work with set scripts or very limited vocabulary. Even so, travellers are unlikely to be able to buy a small, reliable two-way speech translator at the airport just yet. As Dr Maeda notes, mistakes are still common enough to be frustrating. Nor will it be easy to make translating devices that can switch from Iraqi Arabic to, say, French or Chinese.

On the other hand, one-way translation is easier and can be more reliable. IBM, for instance, has a program for translating Arabic and Chinese television broadcasts into English. It is already good enough to find commercial applications. For instance, the system is used by Critical Mention, a company that tracks what is said in Arabic and Chinese news broadcasts and sells that information as a service to other companies.

As speech recognition continues to improve, it will help translation devices get even better. Jim Glass, a researcher at the Massachusetts Institute of Technology's Computer Science and Artificial Intelligence Laboratory, says that it is now possible to use conversational-language programs to operate small hand-held devices. His laboratory is working on using the cell phone as a universal remote control: people will speak into it in order to operate it and to instruct it to operate other equipment, like changing channels on a television. In time, no doubt, the ubiquitous mobile phone will become a language-translator too.