STIC Note

Human Language Technology (HLT)

BACKGROUND

The Science and Technology Innovation Center (STIC) evaluated a new device that can provide real time language translation assistance to U.S. Coast Guard crews. The Coast Guard often interacts with crews that speak different languages. A device that can provide real time translation could increase mission effectiveness by allowing the crews to communicate freely with someone who speaks a different language.

Voxtec SQ.410 Language Translation System

The device evaluated by the STIC was the Voxtec SQ.410 language translation system. The SQ.410 is designed to be worn on your person and provide real time translation capability. The SQ.410 does not need to be connected to any network. It relies on locally stored language libraries that can provide translation in up to 10 different languages at a time.

METHODS

The STIC collaborated with the Army Research Lab that had already been conducting testing and limited deployments with the SQ.410. The goal of the STIC was to acquire SQ.410 devices and conduct a limited user evaluation in a maritime environment aboard a cutter.

EVALUATION

After receiving two SQ.410 devices from Voxtec, the STIC conducted several controlled interactions between team members in different languages. A scenario was provided to participants, who were asked to conduct all communications in only one language using the SQ.410. Laboratory testing found that the SQ.410 required the speakers to annunciate their words clearly and slowly in order for the device to provide an accurate translation.

Due to the four- to nine-second delay in translation during laboratory exercises, it was decided not to recommend use of the SQ.410 in any tactical interactions. However, there could be other less-than-time-critical interactions where the device

might be used, i.e., when foreign language speakers are temporarily housed aboard Coast Guard Cutters and need to communicate with medical or other personnel. The STIC arranged for the USCGC SENECA to take an SQ.410 with them for a deployment to the Eastern Pacific. There is often a lot of interaction with native Spanish speakers in this Area of Operations.

USCGC SENECA Participated in the Evaluation

During their approximately 3-month deployment, the crew indicated they did not use the device but once other than for initial orientation and training. It was reported that, when they tried the device during a boarding, the delay for translation proved to be cumbersome and the native Spanish was not accurately translated. The difficulty in translation was attributed to unusual regional accents and the heavy use of colloquial terms. The SQ.410 is IP54 rated (below waterproof) so there was some concern about its use in a maritime environment, but no issues were reported. (The device was ultimately lost at sea during its initial use on the boarding so there was no opportunity to assess any maritime environment issues.)

CONCLUSIONS

Based on the laboratory testing and user evaluations, the STIC determined that the Voxtec SQ.410 has limited potential for use by the Coast Guard for real time voice translation. One of the biggest hurdles to its wider use is the several second delay to translate and the need to speak slowly to ensure proper translation. One suggested use for the device would be in humanitarian situations where immediate communication (as is required in tactical law enforcement missions) is not needed. Use of connected apps like Google Translate is faster and more accurate; operating offshore requires a dictionary download prior to going out of range.

FUTURE WORK

Given the current trends in machine learning and voice recognition, it is a reasonable assumption that improvements will continue in this area. The STIC will continue to monitor advancements in real time, unconnected translation technology. The STIC will also maintain a collaborative relationship with the Department of Defense and other government agencies that are working on language translation to stay up to date on new advancements.

The Science and Technology Innovation Center (STIC) is a DHS S&T and USCG collaboration.