

DHS Science and Technology Directorate

Automated Speech Recognition Technology – Hands-free Solutions for First Responders

Automated Speech Recognition Technology for First Responders

First responders are often in critical situations where a hands-free voice interface solution could enhance their situational awareness and help ensure their safety. As part of its mission to support the identification and integration of existing and emerging technologies, The Department of Homeland Security Science and Technology Directorate (S&T) has partnered with the Johns Hopkins University Applied Physics Laboratory (JHU/APL) to develop potential Automated Speech Recognition (ASR) technology solutions.

S&T's mission is to strengthen first responder safety and effectiveness to help ensure they have the equipment, technology and information needed to carry out their duties. In particular, S&T supports efforts that identify and integrate existing and emerging technologies to:

- Make first responders safer;
- Help first responders share data and critical information; and
- Help first responders' interoperable communications capabilities for enhanced situational awareness.

Partnering with First Responders & Private Industry

Current speech recognition systems work reasonably well in quiet conditions, but quickly fail when the surrounding background noise increases as is common for first responder situations. JHU/APL is working directly with first responders from Howard County, Maryland, and the JHU/APL Fire Department to document their operational requirements and technology integration needs for potential ASR solutions. They are also working closely with private sector partners who are developing the ASR prototype designs and development plans to support accurate and timely information sharing in noisy response environments.

The initial phase, completed in April 2018, included the release of a Request for Proposals from which three private sector partners were selected. They then began working on their prototype designs and development plans using the provided operational and technical requirements.

With the help of firefighters and emergency response personnel from Howard County and JHU/APL Fire Department, JHU/APL recorded multiple hours of audio from firefighters simulating a response to a house fire. This audio recording is being transcribed and will be provided to each vendor to support the future need for training of algorithms.



Engineers from JHU/APL configure audio equipment with firefighters from Howard County, Maryland.

Prototype Designs and Development Plans

The final prototype will need to easily integrate with existing first responder equipment and personal gear, as well as support and enhance human performance with limited or no interference. It is expected that the final technology solution will have a learning component that enables continued self-improvement of the system's capabilities and provides active noise cancellation for real-time speech recognition without the need for internet connectivity. A prototype is anticipated to be ready for field testing by early 2019. Figure 1 below summarizes the ASR project phases.

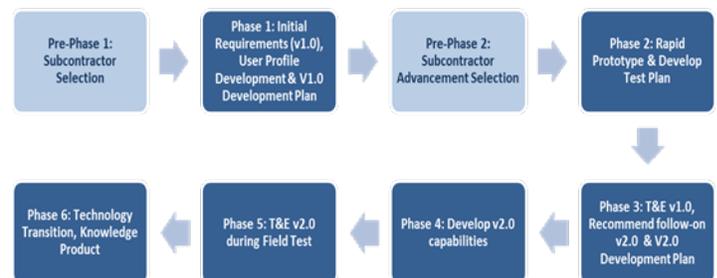


Figure 1: Project Phases



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To learn more about Speech Recognition Technology, contact first.responder@hq.dhs.gov.