Healing Veterans

Detection and Computational Analysis of Psychological Signals (DCAPS)

A Special Q&A

with

Dr. Roy Stripling
CRESST has a long tradition of supporting U.S. military efforts, contributing to its designation as a Center of Excellence by the United States Congress. I recently sat down with Dr. Roy Stripling, CRESST Assistant Director for Assessment, to discuss the CRESST evaluation of an innovative new program, Healing Veterans: Detection and Computational Analysis of Psychological Signals. - Ron Dietel

Ron: Dr. Stripling, can you give me an overview of the Healing Veterans/DCAPS project and the needs it addresses?

Dr. Stripling: Historically, serving in the military has produced increased stress factors, whether it’s the challenge of being stationed in a remote location to being fully engaged in combat. We also know that the transition from military to civilian life can be difficult for some veterans. Consequently, the Defense Advanced Research Projects Agency (DARPA) was interested in finding ways to help veterans track their own mental and emotional well-being after they leave the service. The goal was to create an early indicator system and guide veterans to get help if they need it.

Ron: So this led to some new, very high technology tools?

Dr. Stripling: Yes, DARPA provided funding for several research and development organizations to develop innovative tools to help veterans monitor their psychological wellness. At the same time, CRESST was hired by DARPA and the Office of Naval Research (ONR) to evaluate the tools’ effectiveness. Do the tools produce positive results for veterans; are they cost effective; and if effective, are there ways to make them even better? The goal was to help veterans, both male and female, from all services who have served in either combat or non-combat fields.

Ron: Can you give me some specific details about these new tools?
Dr. Stripling: Yes, one of the tools is a Smartphone application developed by a company called Cogito. It tracks the veterans’ location via GPS, as well as how much he or she uses their Smartphone and its applications. For example, how often does a veteran call or send text messages to other people, which may be an indicator of social wellness. The Smartphone app also measures changes in the rates of phone usage. Is there a regular time of day when a veteran is conversing with others or is there a sudden change in social interaction overall? The app may also help measure a person’s sleep cycle, are they getting up in the middle of the night and texting or calling, for example? Although the app certainly doesn’t provide a full psychological profile, the hope is that it can identify early symptoms of a possible disorder, including depression or post-traumatic stress.

Ron: Any issues that it tracks too much personal information?

Dr. Stripling: The Smartphone doesn’t track “what” a veteran writes in a message, nor does it record phone calls, so it’s not a highly intrusive system. Rather, the app measures the numbers and lengths of interactions over a long-term, about 3 months, as a potential indicator of social wellness. The data will be encrypted as a further safeguard.

Ron: Tell me about the avatar tool that CRESST is evaluating.

Dr. Stripling: The second tool is a virtual human developed by the Institute for Creative Technologies at the University of Southern California. In essence, it’s an avatar (which they call Ellie) that serves as an on-line non-clinical counselor. Through a computer and using two video cameras, Ellie initially asks the veteran a series of background questions, such as “where are you from? What do you like about living in LA?” Gradually Ellie asks deeper, more personal questions, such as “tell me about a time when you were very happy. Tell me about a difficult time you went through.” Based on answers to each question, Ellie poses follow-up questions.

Ron: How does that lead to potential help for the veteran?

Dr. Stripling: During the interviews, Ellie’s cameras analyze facial expressions, body posture, and gestures. Ellie uses speech recognition software, in part developed at Cogito and another company called BBN, to evaluate the tone of the veteran’s voice and looks for patterns that might indicate depression or other psychological issues. The software measures speech rate in order to get a sense of the veteran’s overall mood. Combining visual and audio...
data, Ellie evaluates a veteran’s emotional wellness and can recommend help if needed. One of the advantages to Ellie is that it can provide fast analysis compared to the Smartphone app, about 20 minutes compared to several months.

Ron: Could both tools work better than just each one individually?

Dr. Stripling: The hope is that the two tools will be complementary; that combined, they will produce a more accurate psychological picture than just each one independently. That’s part of our evaluation.

Ron: What’s the long-term goal?

Dr. Stripling: If the CRESST evaluation indicates that the tools turn out to be effective, then ideally, they will be incorporated into broader treatment systems, where a veteran might get help from another veteran or a trained professional. The tools might also help caregivers, providing them valuable feedback to supplement more traditional methods.

Ron: What are some of the specific evaluation questions that the CRESST team is investigating?

Dr. Stripling: First, do the tools themselves actually measure what they are intended to measure? That is, are they valid for their specific purposes? Do they help veterans to monitor their own psychological status and do they lead to veterans seeking help? Second, we are looking at cost effectiveness. What do the tools cost, both the tools themselves plus administration, data collection, and analysis? Third, as I mentioned, if the tools work, do they work better independently or do they work better when combined? Is there value added from some combination of the tools? Finally, we are looking at practicality and utility issues; for example what are the attitudes of veterans toward the tools themselves? Even if the tools are cost effective, valid, and helpful, they can’t do the job if the veterans don’t like and use them.

Ron: What about recruitment?

Dr. Stripling: We’re recruiting more than a hundred veterans to participate in our evaluation, ranging from veterans who are homeless to those working on master’s degrees. We will also be doing some mathematical modeling to see if there is an ideal combination of the different tools.

Ron: As I understand it, even though the project has been in development for several years, it’s now on a fast track. How soon are you expecting answers?
Dr. Stripling: We have about 6 months of data collection ahead of us. Then we have a few months to write up our results and report findings back to DARPA. So yes, we are in a “very” fast-track situation, but extremely excited about it.

Ron: Any last thoughts?

Dr. Stripling: Regardless of the outcomes of the evaluation, we believe that our study is quite cutting edge, collecting and analyzing data in a rather unique way compared to more conventional approaches. Further, we believe that the tools and our evaluation should offer plenty of opportunities to build even better psychological well-being assessment systems in the future. Finally, we hope that the tools and evaluation might lead to applications for non-military people as well.

Dr. Roy Stripling is the CRESST Assistant Director for Assessment, conducting research into computer-based assessment, decision support, information visualization, and distance learning. Prior to CRESST, Dr. Stripling served as the program officer for Human Performance, Training, and Education in the Office of Naval Research’s Expeditionary Maneuver Warfare and Combating Terrorism department. He has also led efforts at the Naval Research Laboratory to assess the training effectiveness of virtual training environments, and to leverage neuroscience technologies and advances in simulation technologies to improve training systems.

Ron Dietel is the CRESST Assistant Director for Research Use and Communications, and a USAF Veteran.

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