Air Force SBIR/STTR

Innovation

Air Force SBIR/STTR Innovation Story

SBIR Topic Number:
AF071-219

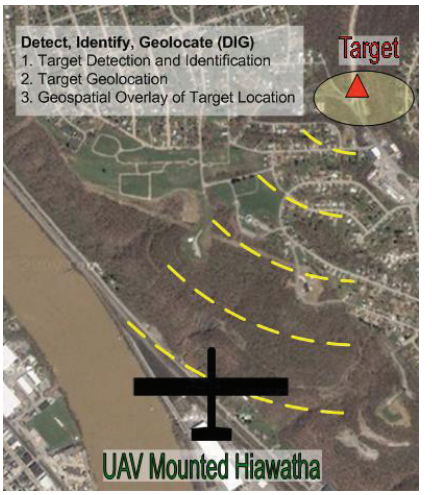
SBIR Title:
Remote-Controlled Improvised Explosive Device Detection Identification and Classification Algorithms (RADICAL)

Contract Number:
FA8650-08-C-1402

SBIR Company Name:
Nokomis, Inc.,
Charleroi, PA

Technical Project Office:
AFRL Sensors Directorate,
Wright-Patterson AFB, OH

This Air Force SBIR/STTR Innovation Story is an example of Air Force supported SBIR/STTR technology that met topic requirements and has outstanding potential for Air Force and DoD.



Left: Remote-Controlled Improvised Explosive Device Detection Identification and Classification Algorithms (RADICAL) Sensor System. Right: Geospatial Overlay of Target Electronics.

Improved Detection of Electronic Targets Used in Improvised Explosive Device (IED) Attacks

- There is a Department of Defense (DoD) need to field technology to efficiently detect, identify, locate, suppress, and neutralize electronic IED attacks
- The RADICAL program is a unique approach to IED defeat that enhances Nokomis' patented Advanced Electromagnetic Location of Electronic Devices (AELED) technology by adding phenomenologically based plug-in modules for detection and geo-location
- The primary objective of the RADICAL program is to provide ground forces operating in urban and complex terrain with information concerning the presence, type, and location of IED associated electronics in real-time
- Nokomis has transitioned this technology into SBIR Phase II and Phase III contracts with the Defense Threat Reduction Agency (DTRA), the Navy, and the Air Force

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Air Force Requirement

The critical service-wide Department of Defense (DoD) need to field technology to efficiently detect, identify, locate, suppress, and neutralize electronic devices from range motivated the U.S. Air Force to invest in the research, development, and testing of technology for Improvised Explosive Device (IED) threat mitigation. The Sensors Directorate of the Air Force Research Laboratory engaged with the Air Force Electronics System Center IED Defeat Office to propose the Remote-Controlled Improvised Explosive Device (RCIED) Detection Identification and Classification Algorithms (RADICAL) Program to meet these needs.

SBIR Technology

Nokomis' patented Advanced Electromagnetic Location of Electronic Devices (AELED) technology is specially designed to Detect, Identify and Geolocate (DIG) electronic devices with a concerted focus on IED triggering electronics. The AELED system provides rapid real-time detection and identification of electronic targets commonly used in IED attacks at demonstrated distances of over 1 kilometer.

The RADICAL program is a unique approach to IED defeat that enhances the AELED technology by adding phenomenologically based plug-in modules for detection and geo-location. This approach provides accurate location and targeting information for a given target using tactically favorable array approaches that are widely accepted in the DoD. A Graphical User Interface (GUI) provides precise target detection, identification, and location information to the user.

Potential Air Force Application

The primary objective of the RADICAL program is to provide ground forces operating in urban and complex terrain with information concerning the presence, type, and location of IED associated electronics in real-time. Nokomis has transitioned into SBIR Phase II and Phase III contracts with the Defense Threat Reduction Agency (DTRA), the Navy, and the Air Force. Together, these contracts satisfy three major components to fielding technology to expertly detect, identify, locate, suppress, and neutralize electronic devices from range. The participating government agencies have worked together to define organizational requirements, combine resources, and efficiently coordinate testing opportunities. Currently, the groups are working to coordinate integration of the technology onboard Small Unmanned Aerial Vehicles (SUAVs) and ground vehicles.

The RADICAL effort was recently awarded transition funding from the Air Force Research Laboratory (AFRL) through the Commercialization Pilot Program (CPP) after stakeholder concurrence on an appropriate SBIR Technology Transition Plan (STTP). The STTP was formed to strengthen and accelerate the development of the geolocation algorithms, a critical aspect of the technology for pinpointing the location of electronic emitters. Enhancements to the geolocation functionality include improvements in localization of multiple targets, studies to account for different array configurations to accommodate changes in the array, geolocation analysis from a moving platform, and a GUI that allows the user to see the overlay of target locations on a map. These enhancements will be transitioned onto a platform recently funded by the Joint IED Defeat Organization (JIEDDO).

Company Impact

"The SBIR program has offered Nokomis the opportunity to pursue state-of-the-art methods of electronics detection, thereby providing the company with unique technology, experience and expertise to become a recognized expert in the field," said Walter J. Keller, President and Chief Executive Officer of Nokomis, Inc. "The AELED and RADICAL technologies are resulting core Nokomis technological capabilities that are expected to provide substantial trailing revenue and growth to the company.

"The SBIR program is a unique asset to the nation's prosperity and national security. It provides a venue for small businesses to excel and the government to make relatively small, yet high return investments in the spirit of innovation that envelops small technology driven businesses. Through SBIR funding, Nokomis has been able to explore breakthrough technology that has the potential to transform how commanders in the field operate. The opportunity to work hand-in-hand with our AFRL partners via this R&D effort has been extremely fulfilling. Nokomis further maintains intellectual property in the form of SBIR Data Rights that provides a footing for competitive positioning in the Defense Industry. The win-win benefits provided to both industry and government participants can't be overstated."

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