Darpa seeks technology to see through clouds for warfighter support

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Advanced, flyable electronics and scene simulation technology sought for video synthetic aperture radar

Warfighters who encounter enemy forces on the ground benefit from overhead aircraft support. Some capabilities are lost, however, when cloud-cover obscures the view. Typically, airborne weapon systems that use electro-optic (EO) sensors during support missions can't "see" through clouds. DARPA's Video Synthetic Aperture Radar (ViSAR) program seeks to develop and demonstrate an Extremely High Frequency (EHF) targeting sensor which operates through clouds as effectively as today's infrared (IR) sensors operate in clear weather.

“The goal is a synthetic aperture radar (SAR) that provides high-resolution, full-motion video to engage maneuvering ground targets through clouds or in the clear, without having to change tactics, techniques and procedures,” said Bruce Wallace, DARPA program manager. “Ultimately, we intend to demonstrate a cloud-penetrating EHF sensor in a moveable gimbal that could be mounted on a variety of aerial platforms.”

DARPA seeks technology proposals in flight-worthy electronics, including power amplifiers and integrated receiver and exciters that are small enough to fit easily aboard aircraft. Another key proposal area is the development of new algorithms which could exploit the features of this sensor technology.

“We’re looking for proposers with advanced expertise in scene simulation software to simulate realistic synthetic EHF radar data sets,” Wallace said. “We anticipate that the system developer will use these raw data sets to test image formation, autofocus, detection and geolocation algorithms.”

The ViSAR system expects to create SAR images of the background at frame rates greater than currently available. In addition, the system should have Ground Moving Target Indicator (GMTI) capability to detect moving targets and reposition their returns in the correct location within the scene. The GMTI processing is done in parallel with SAR processing.

Provided by DARPA