Tactical Imager for Night/Day Extended Range Surveillance

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At a Glance

What is it?

- TINDERS is a tactical imaging system that will covertly track, zoom, and image a moving person, night or day, at several hundred meters range, and identify through face recognition.

How does it work?

- TINDERS illuminates the subject with a focused beam of short-wave infrared (SWIR) light that is completely invisible and eye-safe. The imaging and illumination zoom optics are combined in a lightweight optical package that sits atop a pan-tilt stage that can be mounted on a tripod, vehicle, or structure. Newly developed SWIR image analysis algorithms will be used to track a moving subject and identify through computer face recognition.

What will it accomplish?

- TINDERS will provide the warfighter with a tactical capability to covertly image and identify individuals from a distance of several hundred meters, night or day.

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The Tactical Imager for Night/Day Extended-Range Surveillance (TINDERS) is a tactical imaging system that can covertly track and zoom in on a face hundreds of meters away, capture an image, and identify a person through computer face recognition, in the light of day or the dark of night.

The ability to covertly detect individuals and determine their identities, at night, and from a great distance would provide a major advantage to our forces for a wide range of tactical missions, both offensive and defensive. TheTINDERS system, under development by the West Virginia High Technology Consortium Foundation under contract to ONR, is exploiting a new sensor modality to enable covert, long-range, day and night face recognition with a lightweight, fully automated sensor package suitable for tactical missions.

Current options for nighttime face recognition are limited. Thermal infrared imaging is commonly used for night vision applications, but this lacks the resolution and repeatability needed for face recognition . The TINDERS system will illuminate the subject with a “short-wave infrared” (SWIR) beam of light that is completely invisible and eye-safe, and will produce a repeatable facial image that can be quickly matched against a gallery of standard photos using computer face-recognition algorithms.

In its final form, the TINDERS optical assembly will weigh only 20 lbs and be capable of zooming into and tracking a face out to a range of 800 m. The optics, along with all supporting hardware and software, will be integrated into a rugged, easy-to-use, portable system. TINDERS will be the first system capable of long-range night-time face-recognition, enabling a powerful new capability.

Research Challenges and Opportunities:

- *Developing lightweight (20 lbs.) SWIR zoom optics to illuminate and image a face out to a range of 800-m with sufficient image quality for face recognition.*
- *Developing face recognition algorithms to match SWIR facial images against a database of standard visible-light images.*
- *Developing tracking system to keep a moving, zoomed-in face within the camera field of view at 800-m (0.5 mile) range.*