

Multi-Sensor and Multi-Platform Exploitation for Combat ID

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Air Force MOIE

The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow, orange, and blue to the left of the text.

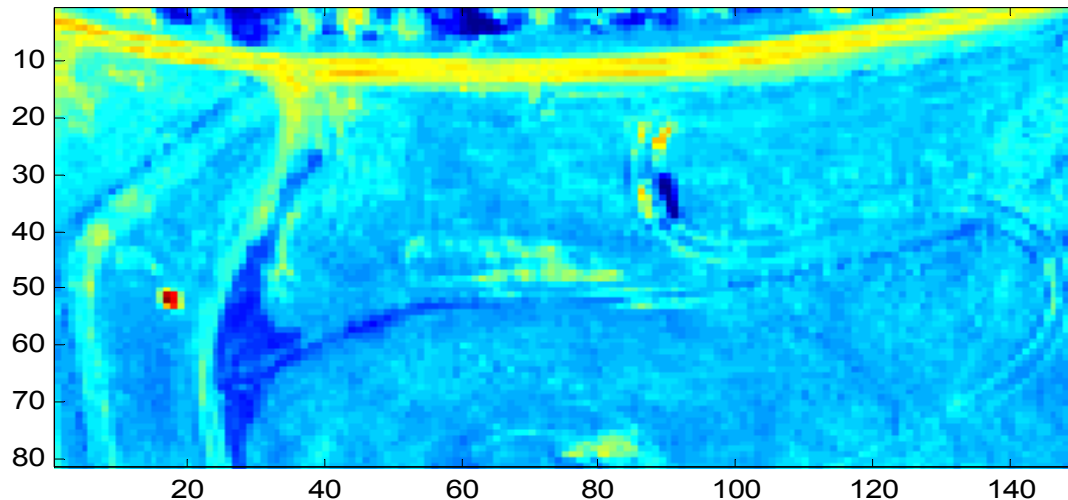
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Technology
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Problem

- **An unresolved issue with multi-sensor and multi-platform surveillance systems is an analytically tractable approach to target ID and Automatic Track Verification (ATV).**
- **Historically, target ID and ATV algorithms have been developed in ways that make it difficult to predict the improvement in system performance that could be gained by including data from new sensing modalities.**

Background

Theoretical approaches to target ID and ATV can provide the ability to analyze and predict performance and, therefore, allow sensor systems developed for one application to be readily assessed in other problem domains.



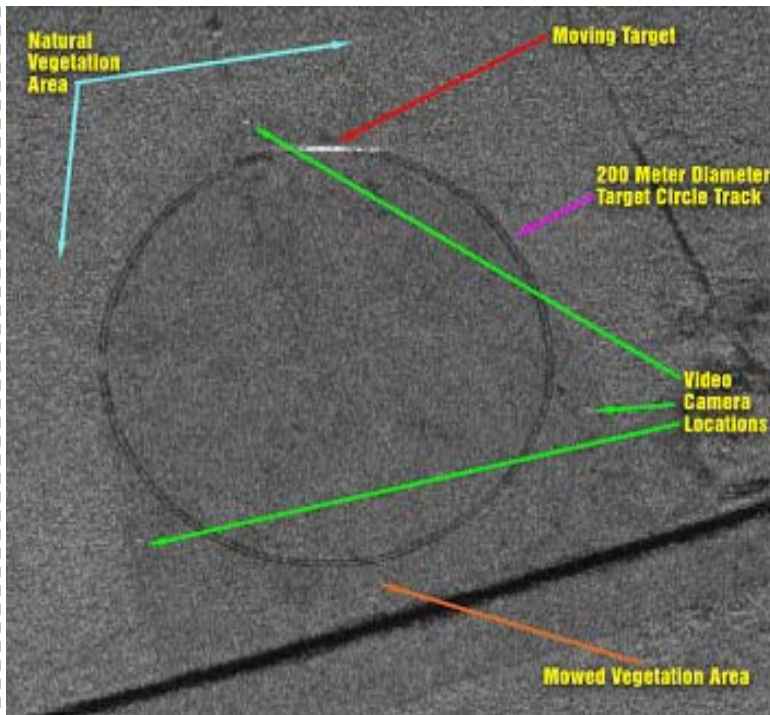
Objective

- **The objective of this MOIE project is to develop, implement, and evaluate optimal fusion approaches for target ID. These fusion approaches will be developed within a unified analytic framework that will allow them to be readily employed in multiple problem domains. These diverse domains range from ground combat situations, where both non-cooperative and/or cooperative targets are present, to space-based and airborne multi-platform sensor systems.**

Activities

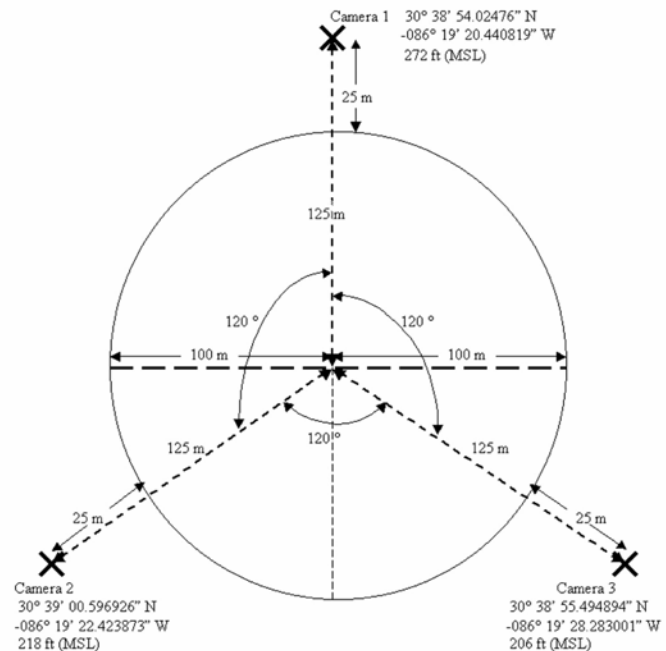
- **Develop a multi-sensor Automatic Track Verification (ATV) algorithm that will be evaluated with data from the DARPA Moving Target Feature Phenomenology MTFP program.**
- **Develop a multi-phenomenology (SAR and hyperspectral) CID algorithm and multi-resolution registration procedure that will be evaluated with data from the DARPA SHADE program.**
- **Develop a space-based radar adaptive sensor tasking and Ground Moving Target Indicator (GMTI) track association algorithm.**

Highlight: ATV Data Collection Geometry



Three Video Cameras Staged at Equal Distance Locations on Exterior of 200 meter Diameter Target Track

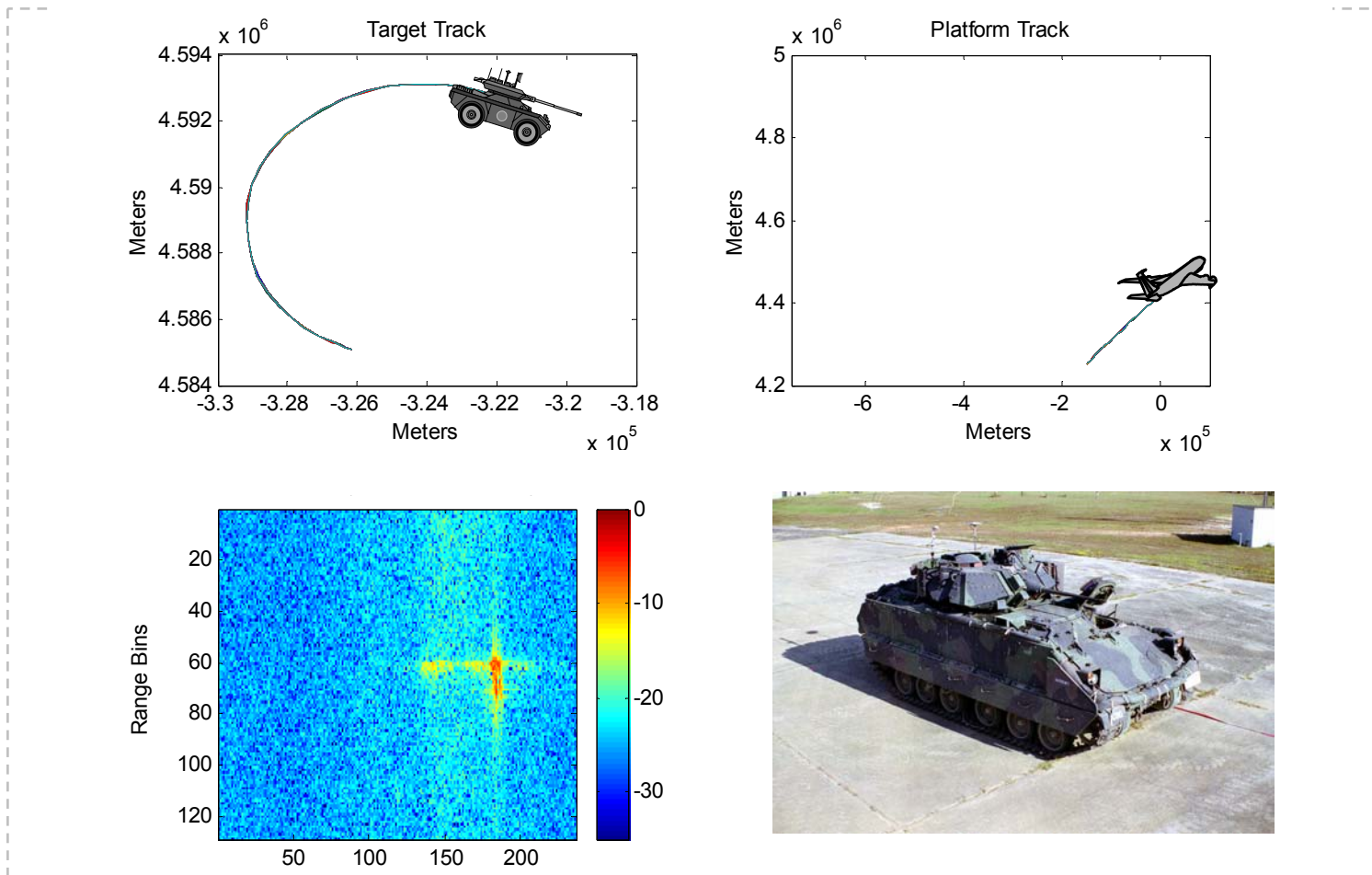
Target circle path center: $30^{\circ} 38' 56.7814''$ N
 $-086^{\circ} 19' 23.7611''$ W
 208.2297 ft (MSL)



NOTE: All camera sites GPS Lat/Lons and elevations were collected by a consumer Magellan 300/Blazer12 unit.

Note: Information for Camera 2 & 3 was transposed on original, corrected on 02/08/2001

Highlight: ATV Data Analysis



Impacts

- **The approaches developed in this MOIE project will improve TCT detection and tracking performance and will assist the automation of Intelligence, Surveillance, and Reconnaissance (ISR) tasks towards the goals of information superiority and global awareness that are the Joint Vision 2020 Integrated Command and Control target end-states.**

Future Plans

- **Transition Combat ID and Fusion Algorithms to:**
 - **Ground Surveillance radar systems**
 - **Air and Space Surveillance radar systems and Multi-Platform Tracking programs**
 - **Ground Stations**
 - **Proposed Multi-Sensor ISR Systems**



Decision-Quality Information