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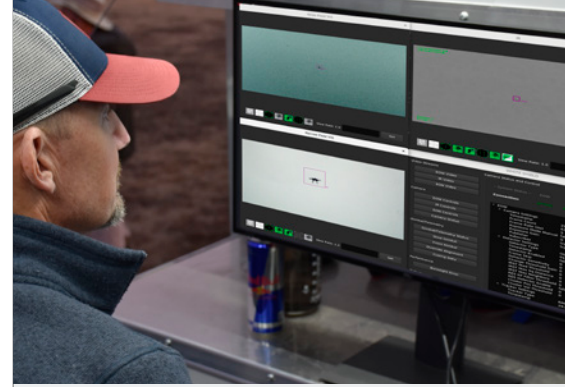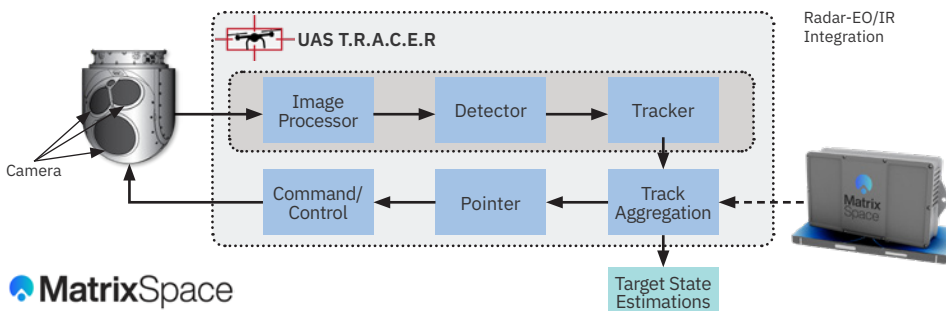# MODULAR SYSTEM INTEGRATION TO MEET UNMANNED AERIAL SYSTEMS (UAS) THREATS

Multi-Modal Counter-UAS (C-sUAS) Detect and Track Integration

L3Harris partnered with MatrixSpace to demonstrate multi-modal (radar + passive EO) sensor integration and data processing using the L3Harris UAS Threat Recognition and Counter Enabler (TRACER) software. The collaborative team performed multiple integration activities leveraging the Oklahoma Aerospace Institute for Research and Education (OAIRE) to field Group 1 and 2 UAS as well as simulated payloads. The team integrated a WESCAM MX™-series electro-optic and infrared (EO/IR) turret and the MatrixSpace MS01100 radar, using UAS TRACER and performed slew-to-cue from radar tracks to EO/IR pointing commands. L3Harris provided UAS TRACER, built on top of the Chimera modular framework, to perform the data processing and turret control.

EVENT SUMMARY

L3Harris coordinated with OAIRE to facilitate flight access, targets and pilots for two events in summer 2024 and provided the EO/IR turret and software. MatrixSpace provided a MS01100 radar, advanced access to the device interface and event support. The team successfully used a radar track that was not in the turret field of view as a pointing cue to point the turret and obtain custody of the target. The system detected and tracked both fixed-wing and multi-rotor Group 1 and Group 2 targets operating at 800 m-1.2 km for simultaneous track from both sensor data streams. The UAS TRACER application processed both data feeds and controlled the turret for this operation. This multi-modal demonstrator paves the way for expanded deployments and the exploration of Artificial Intelligence/Machine Learning (AI/ML) techniques operating on EO/IR and Radio Frequency (RF) data.

POWERFUL DEMONSTRATION

> Joint capabilities integrating real-time, radar-based drone tracking with an EO/IR sensor system

> UAS TRACER employs machine learning (ML) software capabilities to recognize specific types of UAS threats within the mission concept of operations

> The MatrixSpace MS01100 is a small, lightweight, low-cost and portable high-performance radar enabling users the ability and power to digitize their outdoor environments

COLLABORATIVE INTEGRATION EVENT

The event demonstrated the capability to pair small and large business innovations into a modular C-sUAS capability demonstrator. The success of this integration enables the businesses to bring right-sized capabilities to C-sUAS challenges.

Radar-EO/IR Integration

UAS T.R.A.C.E.R

| Image Processor → Detector → Tracker |
| Command/Control ← Pointer ← Track Aggregation |

Camera

Target State Estimations

MatrixSpace