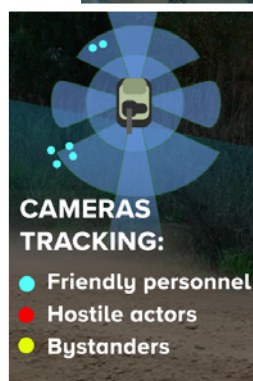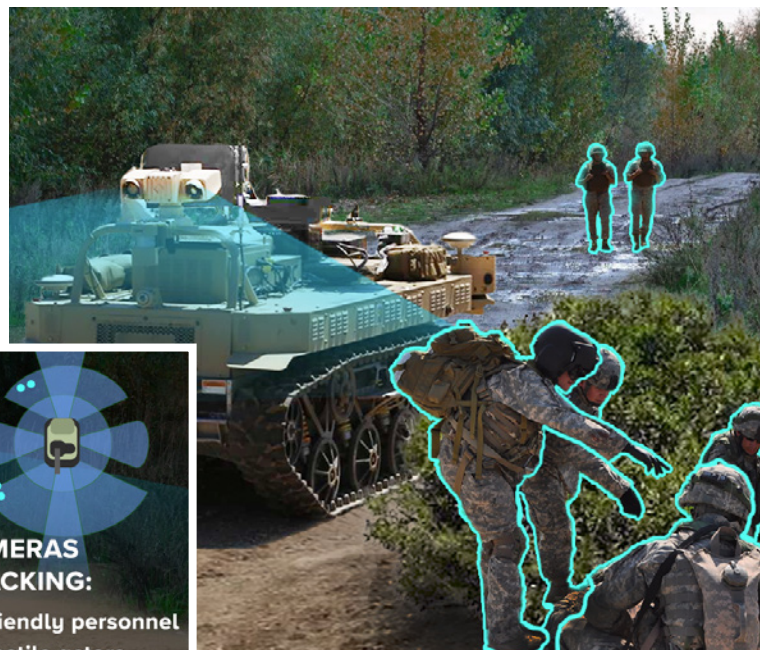# ASIMOV

A multicamera tool that ensures safer operations using machine learning

Situational awareness

ASIMOV is a self-contained detection system that identifies and tracks humans in the vicinity of ground vehicles. ASIMOV is designed to differentiate between friendly personnel, bystanders, and hostile actors. These inferences are made from a combination of visual cues and human behavioral detections, including adversarial actions meant to mislead common detectors.
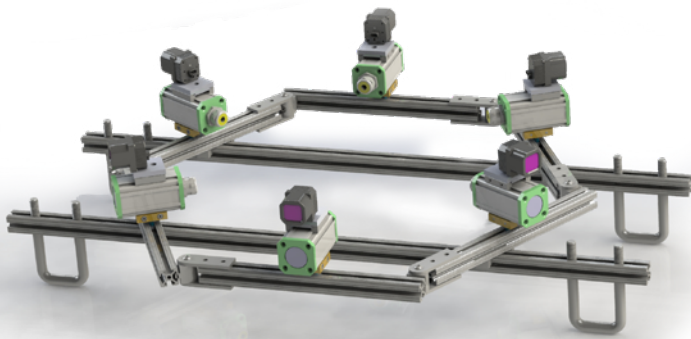
Self-contained, vehicle-agnostic hardware

Containing a combination of high-performance electro-optical (EO) and long-wave infrared (LWIR) sensors, ASIMOV can be easily mounted to most vehicles and provides 360-degree observations around the vehicle. ASIMOV is self-contained, requiring only an additional power source. All processing is internal to ASIMOV, and the system can be easily transferred between machines.

CAMERAS TRACKING:
- ● Friendly personnel
- ● Hostile actors
- ● Bystanders

[Warfighter] Standing

[Warfighter] Standing

Human (0.73) Human (0.72)   Human (0.48) 0.50)   Human (0.13) uman

Robust detections even in challenging conditions

Vision systems are challenged by rural or combat environments. The ability to perceive may be negatively impacted by poor lighting, inclement weather, and the presence of visual occlusions such as dust and vegetation. ASIMOV's use of non-emitting multispectral sensors overcomes all these conditions, allowing for robust detections in circumstances that would otherwise prohibit function.

ASIMOV is explicitly trained to detect and track humans in atypical poses (crouching, sitting, prone) and who are heavily obscured (by foliage or debris). ASIMOV's detection technology is built on advances from Awarion™, Charles River's Autonomous Lookout System, which has been successfully integrated and demonstrated in Navy and Army platforms.

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ASIMOV hardware setup

Safety conscious

ASIMOV's detections are provided to the user or downstream architecture with metrics that indicate the likelihood that the detection is a false positive/false negative. Relay of these metrics can inform changes in behavior according to the mission, ensuring more conservative operations where human presence is less certain.

Observations made by ASIMOV use non-emitting sensors, ensuring that vehicles are not compromised in their ability to maintain a low profile during military operations.

Relative geospatial tracking

ASIMOV tracks the relative geospatial location of humans as they move about the vehicle, providing actionable information that can inform navigation behaviors that ensure safe vehicle operations and data analytics for reconnaissance missions.

Relative geospatial tracks are informed by vehicle movement, enabling more accurate track maintenance and recovery of lost tracks should the line of sight, to a target that is being tracked, be broken.

Key advantages

- **360-degree observations provide complete coverage of the vehicle.**

- **Humans can be detected in atypical poses or while heavily occluded.**

- **EO/IR sensing enables operations at day, night, and in unfavorable weather.**

- **Self-contained technology interfaces with most vehicles.**

Autonomy you can trust

Charles River Analytics uniquely combines agile innovation and leading-edge research with a decades-long track record of hardened engineering in austere environments to create best-in-class solutions to diverse, challenging problems.

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