



# Airborne Computer Vision



## AT A GLANCE

### WHAT IT IS:

The Airborne Computer Vision (ACV) computer can be hosted onboard multiple Unmanned Systems (UxSs). The ACV computer is capable of “mimicking” aspects of human-level analysis of imagery collected by UxSs. The ACV computer will autonomously detect, classify, identify and geo-locate maritime vessels at sea and in port. The Fleet is notified of any vessels of interest.

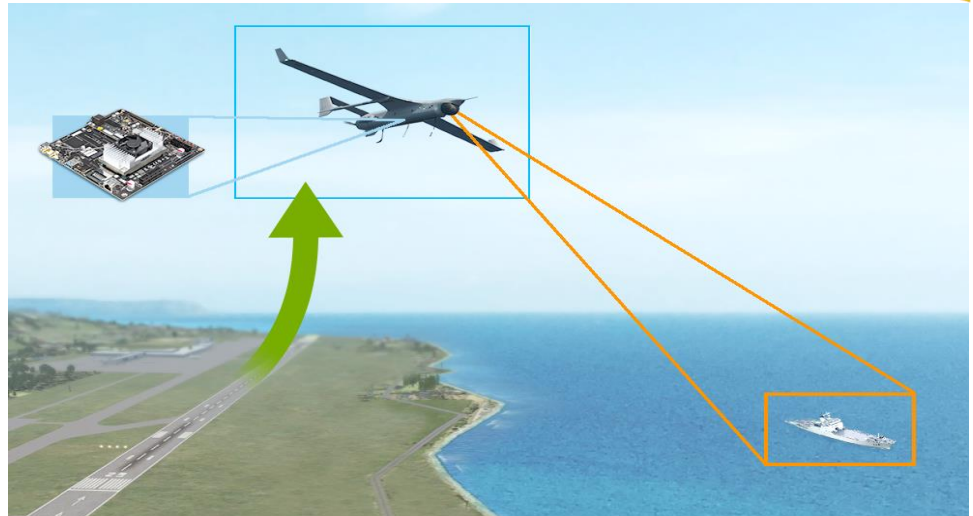
### HOW IT WORKS:

Hosted on UxSs, the ACV computer autonomously searches images for vessels and classifies them by their size, 3-D shape, and colors. Next, pattern matching is used to compare detected vessels against a library for positive identification. In parallel, measurements are collected to accurately determine the position of the vessel. If a vessel meets pre-defined criteria, the Fleet is provided with an alert.

### WHY IT IS IMPORTANT:

ACV provides commanders at sea a means to autonomously identify vessels of interest, improving their decision capability. The ACV computer reduces the time to process/act on critical information.

*\*Unmanned Warrior is part of exercise Joint Warrior 2016, hosted by the United Kingdom off the North-West coast of Scotland.*



The ACV computer provides autonomous, persistent, and rapid analysis of maritime and land-based imagery. ACV computers can be hosted as payloads on multiple manned and UxS platforms, and with multiple models and types of imaging cameras. An open-architecture framework allows for the rapid integration of new sensors to the ACV computer, which in turn disseminates the critical information to fleet commanders. In addition to vessels, the ACV computer can detect, classify, identify, and geo-locate buildings, bridges, vehicles, and people. A fully digital process eliminates common human errors and provides opportunities for fleet commanders to increase the speed of warfare.

The ACV technologies are being tested to support multiple missions of interest to the United States. These missions span from Combat Support Agency maritime chart production to squad-level littoral Reconnaissance Surveillance Target Acquisition (RSTA) operations. Multiple US partners have funded the development of the ACV technologies which are managed under the Office of Naval Research.

Unmanned Warrior 2016, allows US Navy, British Royal Navy, and Allies to test UxS technologies in real operating environments with coalition forces. UxSs will be deployed from shore facilities and operate in varying locations along the Scottish northwest coastline.

### Research Objectives for US in Unmanned Warrior 2016:

- Joint operations with US-UK equipment
- Explore employment concepts and technology capabilities
  - Low cost, multi-mission, persistent ISR
  - Expansion of battlespace surveillance capability
  - Autonomous combat identification at sea