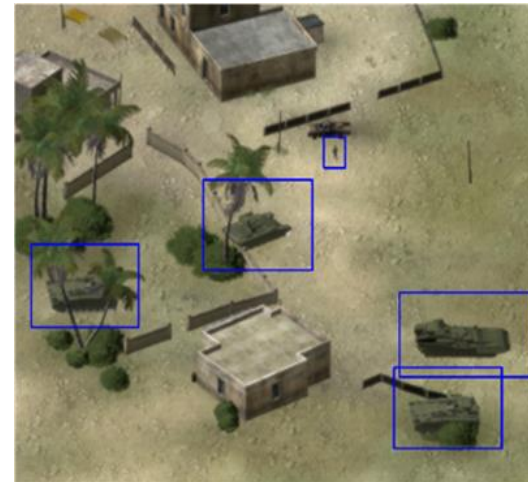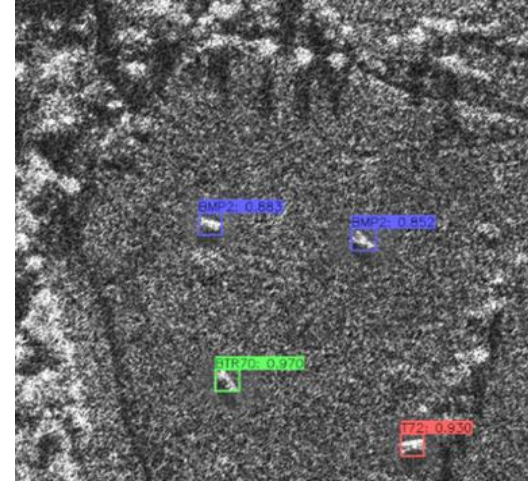Richard O. Lane, Adam J. Wragge, Wendy J. Holmes, Stuart J. Bertram, Tim Lamont-Smith

Object Detection in EO/IR and SAR Images Using Low-SWAP Hardware

- Created a large annotated dataset:
  - EO and IR images, containing vehicles and people
  - Simulated with Virtual Battlespace 3 (VBS 3)
  - Real SAR scenes captured from a Tornado aircraft
  - Target and clutter image chips inserted at suitable locations

- Low-SWAP Nvidia Jetson Xavier NX
  - Light (24 g); small (70 mm x 40 mm);
  - low power consumption (10-15 W); contains a GPU

- Assessed three deep-learning based algorithms:
  - RetinaNet, EfficientDet, YOLOv5

- Trained algorithms with elastic compute cloud (EC2)

- Measured speed and accuracy at inference time:
  - On EC2 instance and NX
  - Made hardware-specific optimisations on the NX

Nvidia Jetson Xavier NX

Developer Kit

Production Module

QINETIQ