



Image Science & Applications Branch

Remote Sensing Division

Overview

OUR RESEARCH AT A GLANCE

Signal Processing

The branch focuses on novel signal processing techniques applied to remotely sensed data, particularly SAR complex data, to extract unique information regarding man-made and environmental phenomena.

Remote Sensing Operations

Working with the remote sensing community, particularly emerging commercial SAR Satellite vendors, the branch is investigating new and innovative approaches to operations and exploitation.

Maritime Surveillance

The branch's ocean surveillance algorithm improves maritime domain awareness for naval operations by providing automated ship detection and characterization from SAR data.

Machine Learning

Adapting commercially developed machine learning methods to the unique properties of SAR has provided new insights in streamlining routine image interpretation tasks and is revolutionizing automated target recognition.

R&D Sponsors

ONR, NAVSEA, NAVAIR, DARPA, Intelligence Community

Point of Contact

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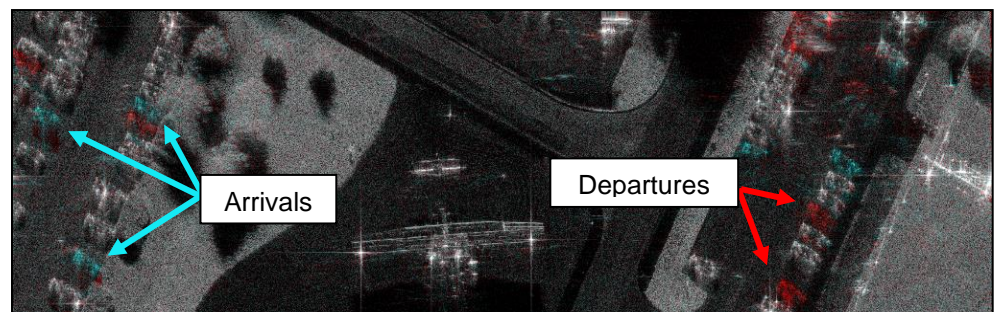


Convolutional neural network and heuristic ship detection techniques applied to commercial SAR data. Image source: © 2022 Capella Space Corp.

The Image Science and Applications Branch is engaged in basic and applied research programs focused on improving remote sensing system capabilities and image exploitation techniques. This research advances the understanding of signal and image processing, oceanographic phenomena, and environmental effects through state-of-the-art analytical, modeling, and simulation techniques.

Branch support to military and intelligence operations helps to inform which R&D initiatives to pursue and ensures our efforts remain on a path toward transition to practical applications. The branch has established a reputation for applying leading edge tools and technologies to the specific needs of customers and finding creative solutions to address intelligence "hard problems".

Technical expertise encompasses signal processing and software development for remote sensing imaging systems across the electromagnetic spectrum, with an emphasis on synthetic aperture radar (SAR) systems. The branch is pursuing innovative ways to task, operate, process and exploit these systems to expand utility beyond initial engineering intent. With the recent increase in the number and capabilities of commercial SAR sensors, the branch is investigating utility for naval applications via novel signal processing approaches to extend area coverage, direct downlink services to decrease timelines and machine learning to improve automated target recognition.



Amplitude change detection derived from FARAD airborne SAR. Imagery courtesy Sandia National Laboratory.