PEO IWS Programs and Projects
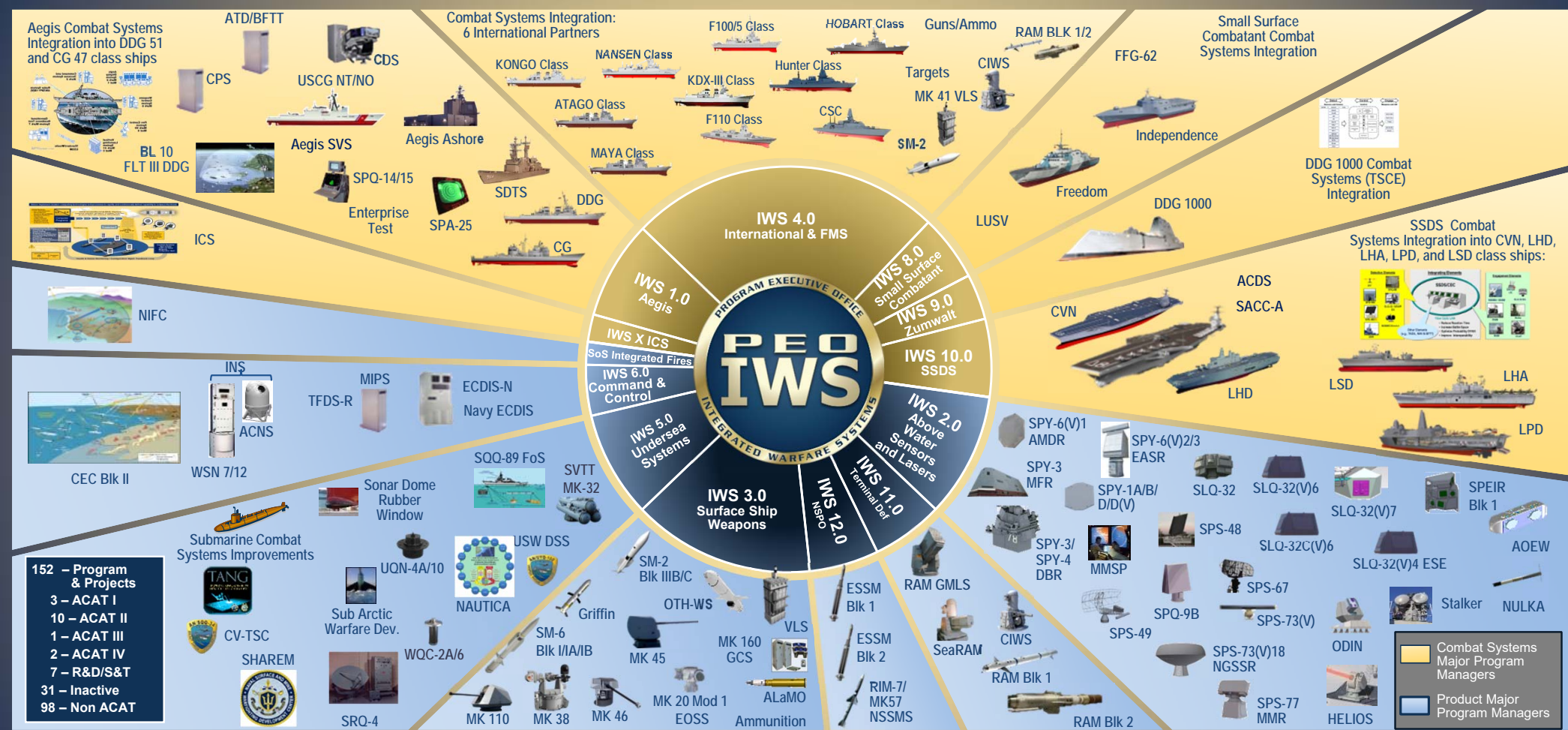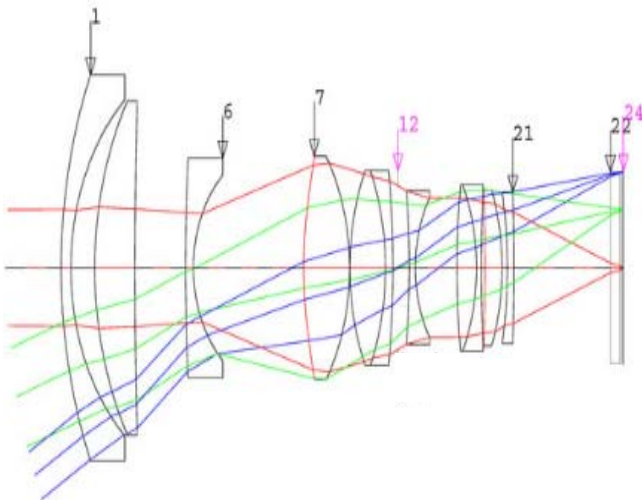
PEO IWS 2.0

Topic Number: N23A-T011,

Topic Title: Innovative Optics for Wide Field of View Infrared Sensors

Technology Objective: Develop fast (large aperture) optics for a wide field of view (WFOV) imaging sensor operating in the mid-wave and short-wave infrared (MWIR and SWIR) bands with large format focal plane arrays (FPAs).

Technological Challenge/Risk: Developing an optical design that meets the depth of field requirements without the need for prohibitively expensive assembly, alignment, positioning, or dynamic compensation techniques.

Transition Program: Initial transition is to an ONR FNC or Tech Candidate, followed by a final transition into a future increment of the SPEIR program of record.

Topic Author: Lawrence Dressman

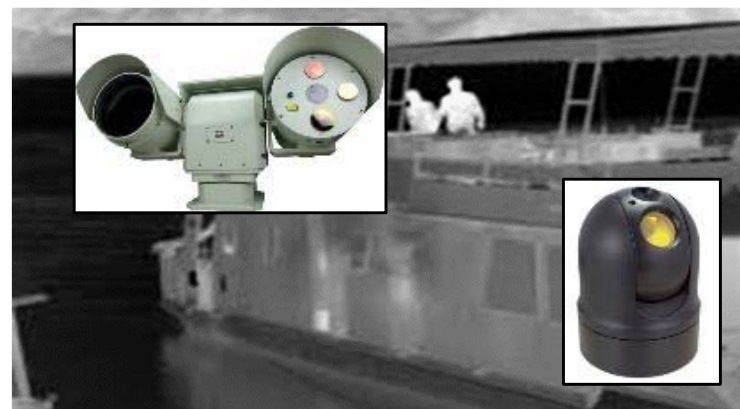
Topic Number: N231-045

Topic Title: Multi-Spectral, Multi-Sensor Image Fusion

Technology Objective: Develop algorithms for real-time fusion of digital infrared (IR) video imagery originating from different sensors operating in different IR bands to create a fused image stream of high fidelity and resolution thereby improving target classification and identification.

Technological Challenge/Risk: Fusing video image data in real-time from high frame rate, high resolution, large format sensors. Fusing data from sensors that are widely separated (spatially) is another technical challenge.

Transition Program: Transitions to SPEIR program of record.

Topic Author: Lawrence Dressman

NAVSEA SBIR/STTR
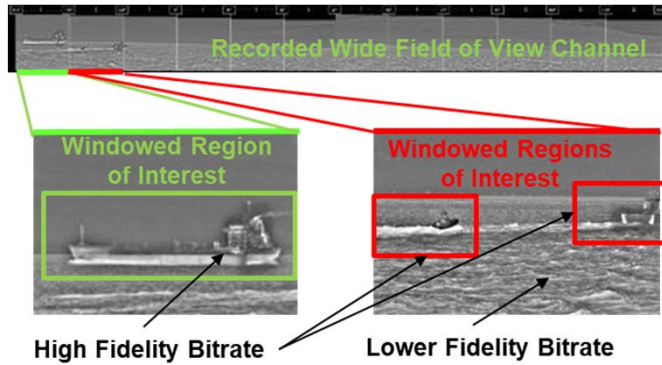## PEO IWS

Topic Number: N231-056

Topic Title: Intelligent Capture of Digital Imaging for Systems Engineering, Modeling, and Training

Technology Objective: Develop a high-capacity digital video imagery recording system that provides intelligent selection and efficient organization and storage

Technological Challenge/Risk: Developing a video identification algorithm that correctly selects video samples under highly dynamic conditions. Optimal compression of stored video is a secondary challenge and risk.

Transition Program: Initial transition is to the Shipboard Panoramic EO/IR (SPEIR) program of record. The technology is not in the SPEIR critical development path and transitions to the program when ready.

Topic Author: Lawrence Dressman

PEO IWS 3.0

Topic Number: N231-030

Topic Title: Model-Centric Safety Analysis Tools

Technology Objective: Apply Model Based System Engineering (MBSE) tools to create a model representing the safety process required to develop and deploy advanced Navy munition systems.

Technological Challenge/Risk: Apply MBSE approaches to integrate multiple munition safety requirements and procedures in order to build a data-centric understanding of the required space. This will allow for a level of automation to design analysis which will drive down overall costs to the program.

Transition Program: This technology will be developed for and transitioned to Naval Missiles (e.g., SM-6 and Over-The-Horizon (OTH)) and Projectile programs.

Topic Author: LCDR Ashley Wessel
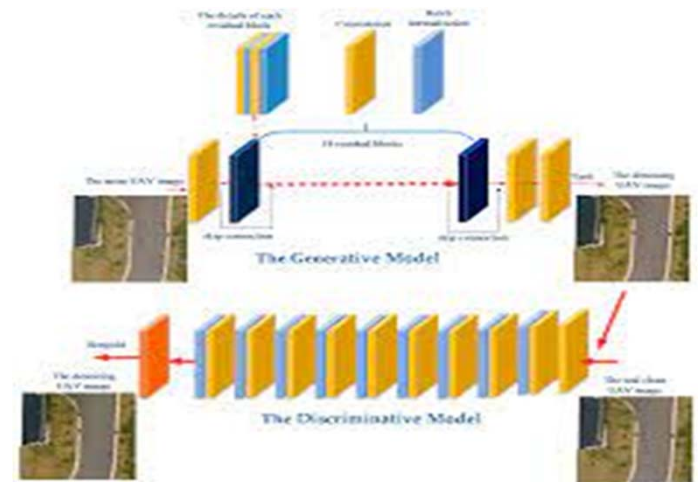
Topic Number: N231-037

Topic Title: Gun Weapons Systems Synthetic Unmanned Aerial Systems Imagery Data Set

Technology Objective: Develop a synthetic imagery dataset of Unmanned Aerial Systems (UAS) using machine learning for computer vision discriminator applications.

Technological Challenge/Risk: Visualization models can be unstable and diverge, produce limited varieties of samples, and the generator gradient vanishes so nothing is learned. Discrimination techniques can have high error rates.

Transition Program: Navy Gun Weapons Systems (e.g., MK 160 and MK 110) . Other PEO IWS C-UAS Systems (as appropriate)
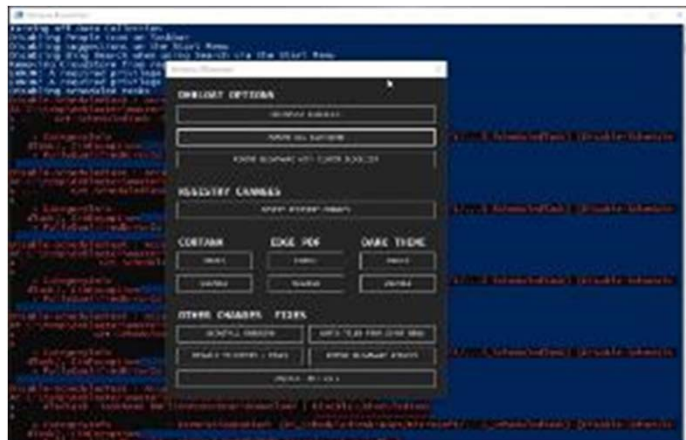
Topic Author: Benjamin Goldman

PEO IWS 5.0

NAVSEA SBIR/STTR
PEO IWS

Topic Number: N23A-T009

Topic Title: Generalizable Tactical Software Artificial Intelligence or Machine Learning-Informed Debloating

Technology Objective: Develop a capability that leverages artificial intelligence and machine learning (AIML) technologies to de-bloat tactical software to reduce support costs, improve run-time stability, and reduce cybersecurity vulnerability.

Technological Challenge/Risk: Reduce the time required to de-bloat software.
Achieve high accuracy in de-bloating while maintaining or improving system performance

Transition Program: IWS 5.0 Software Production processes.

Topic Author: Meg Stout

Topic Number: N23A-T010

Topic Title: Sonar Dome Anti-Fouling Tracking and Prediction Tool

Technology Objective: Develop a capability to collect, analyze, and predict levels of Tributyltin Oxide (TBTO) in deployed sonar domes.

Technological Challenge/Risk: TBTO remains the only viable means of preventing biofouling on sonar domes. Developing a solution to track maintenance and predictions of TBTO efficacy.

Transition Program: Transition will be a stand-alone tool for tracking TBTO data collected for a hardware measurement capability in radomes in PEO IWS 5

Topic Author: Patrick Lockhart

NAVSEA SBIR/STTR
PEO IWS

Topic Number: N23A-T014

Topic Title: Automated Knowledge Base Extraction and Student Assessment

Technology Objective: Develop an automated capability to generate exams with answer keys using Artificial Intelligence or Machine Learning (AI/ML)-powered data mining for Undersea Warfare (USW).

Technological Challenge/Risk: Assimilation of complete USW reference information Ability to transition more instructional content and time to high-fidelity virtual trainers

Transition Program: IWS 5.0 Training Infrastructure

Topic Author: Meg Stout

Topic Number: N231-029

Topic Title: Software Incident Report Capture and Scripting

Technology Objective: Develop a continuous event recording and incident capture tool that collects metadata to enable the recreation of conditions associated with an error observed by the test team and generates test scripts for automated testing of conditions to validate fixes.
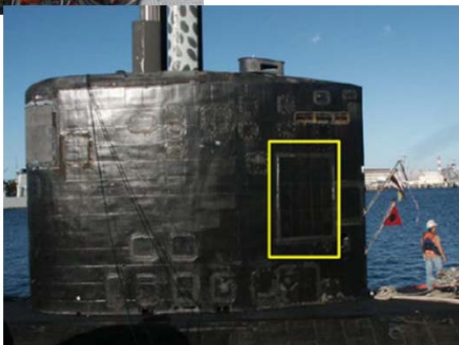
Technological Challenge/Risk: Validation of Bugs fixes will rely on properly capturing data and associated metadata. AI/ML needed to parse bug-related data from background data flows

Transition Program: IWS Combat System T&E FFR

Topic Author: Rob McNeal

NAVSEA SBIR/STTR
PEO IWS

Topic Number: N231-031

Topic Title: Automated Cavitating Waterjet Cleaning Device

Technology Objective: Develop an automated cavitating waterjet cleaning device for conformal hull array areas.

Technological Challenge/Risk: Environmental Impact issues
Operability. Visual Inspection of efforts below the waterline. Safety of Array Panels/Units, Out Board Electronics, and OBE Connections

Transition Program: In-Service Support

**Topic Author:** Robert White

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Topic Number: N231-032

Topic Title: Launchable Mini-glider for Variable Payloads

Technology Objective: Develop a launchable mini glider sensor platform able to survive 48 hours in service within the water column.

Technological Challenge/Risk: Current XBT buoys are single-use
Current collection requires specific deployment on a periodic basis, resulting in point measurement

Transition Program: USW systems

Topic Author: Pete Scala
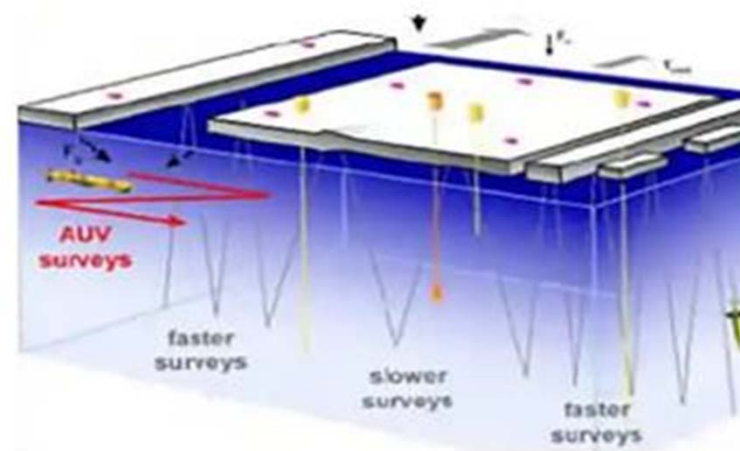
NAVSEA SBIR/STTR
## PEO IWS

Topic Number: N231-034

Topic Title: Open Architecture Telemetry First Level Multiplexer with Array Power Distribution

Technology Objective: Develop a single Open Architecture Telemetry (OAT) component which combines the functionality of an OAT First Level Multiplexer (FLM) with the array power distribution component (power shunt).

Technological Challenge/Risk: Optimization of shunt functionality for efficiency. Regulation of augmented dynamic power

Transition Program: Future USN towed arrays using OAT

Topic Author: Rob Cutler
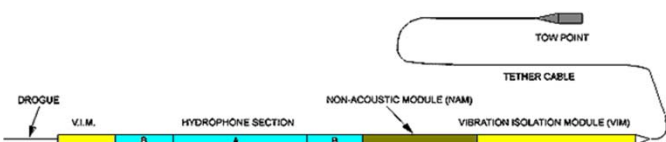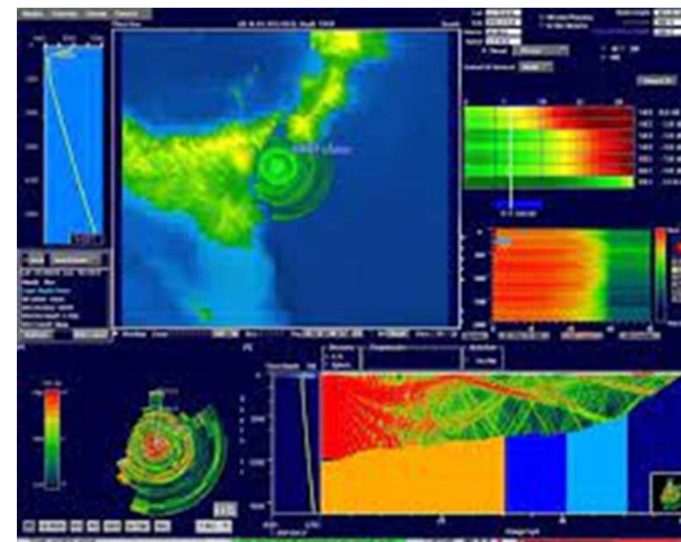

Topic Number: N231-044

Topic Title: Undersea Warfare Decision Support System Virtualized Training and Expeditionary Unit

Technology Objective: Incorporate advances in virtualization and gamification to modernize USW DSS training from current curricula toward integrated USW C2 training. Develop a portable expeditionary user interface that can deliver this training throughout the enterprise.

Technological Challenge/Risk: Operators need training that better supports proficiency, enables operators to keep pace with CI/CD upgrades
USW-DSS systems are present throughout the locations supported by the Navy, driving expeditionary requirement
Transition Program: USW-DSS

Topic Author: Mike Essig

NAVSEA SBIR/STTR
PEO IWS

Topic Number: N231-049

Topic Title: Artificial Intelligence or Machine Learning Video Processing and Packaging

Technology Objective: Develop an automated tool to identify video images of interest using Artificial Intelligence/Machine Learning (AIML) to be sent to warfighters in real-time.

Technological Challenge/Risk: Using AI/ML approaches to identifying video content of interest to maximize information density in imagery transmitted in real time

Transition Program: USW-DSS, MPRA systems

Topic Author: Mike Essig