Department of the Navy SBIR/STTR Transition Program

Topic # N231-037
Gun Weapons Systems Synthetic Unmanned Aerial Systems Imagery Data Set
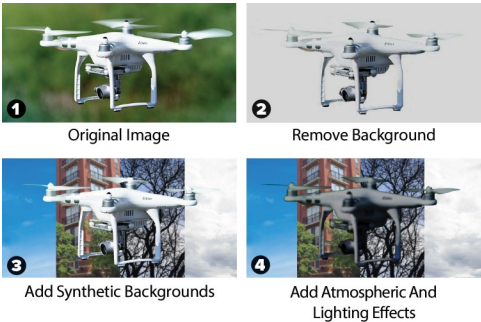Archarithms, Inc.

WHO

SYSCOM: NAVSEA

Sponsoring Program: NAVSEA

Transition Target: U.S. Navy surface ships, USMC and Navy shore installations, Critical infrastructure protection Mission Applications: Protection of ships and expeditionary assets, Counter-UAS, Counter-cruise missile, Counter-manned aircraft, Armed personnel detection, and localization (USMC)

TPOC: (540) 656-9743
joshua.e.mollohan.civ@us.navy.mil

Other Transition Opportunities: U.S. Army C-UAS and ISR programs (RCCTO, DEVCOM), U.S. Air Force base and asset protection (AFWERX, SF/Defender initiatives), DHS and CBP for border surveillance and security, NATO and allied military C-UAS solutions, Commercial security: nuclear facilities, airports, stadiums, Critical infrastructure: energy, utilities, ports, rail

Notes: ImageBrew supports aerial, maritime, ground, and indoor target detection and identification. Originally created for counter-UAS, it has broader surveillance uses. Component testing with surrogate imagery planned Q3 FY26. Commercial potential in critical infrastructure surveillance. Candidate for Aegis Combat System AI/ML integration; seeking support for TRL 6-7 transition.

Original Image — Remove Background — Add Synthetic Backgrounds — Add Atmospheric And Lighting Effects

ImageBrew® generates data from captured images, augments the images with environmental effects and labels the data to required specifications.

WHAT

Operational Need and Improvement: The Navy needs faster, more effective ability to detect, identify and defeat threats in cluttered, contested environments. ImageBrew rapidly generates realistic, labeled imagery to improve AI model accuracy, reduce false alarms, and enhance shipboard and fixed-site gun system performance.

Specifications Required: Compatible with common AI frameworks
Standard image formats (JPG, PNG) at 1080p+ resolution
Embedded metadata per DoD standards
Cybersecurity-compliant for DoD environments

Technology Developed: Arcarithm's ImageBrew, an AI-powered synthetic image generation and augmentation tool, accelerates the training of computer vision algorithms for Department of the Navy applications. ImageBrew automates the creation of highly realistic imagery—complete with embedded metadata, environmental effects (e.g., weather, lighting, motion blur), and labeled targets—enabling faster, more accurate training of AI models for object detection, classification, and identification. The technology supports automated annotation, metadata insertion, and environmental simulation to meet operational demands such as counter-UAS, counter-cruise missile, and armed personnel detection missions.

Warfighter Value: ImageBrew enhances the warfighter's ability to detect, classify, and respond to airborne, sea and ground-based threats—especially in contested and cluttered environments. By rapidly generating high-quality, labeled training data for computer vision AI models, ImageBrew enables faster development and deployment of detection and identification systems. This means more accurate and timely threat recognition using shipboard or ground-based sensors integrated with existing weapon systems, such as naval guns. The improved precision and reduced false alarm rates increase engagement confidence, reduce cognitive burden, and ultimately protect critical assets, personnel, and platforms.

WHEN

Contract Number: N00024-24-C-S184   **Ending on:** Aug 21, 2025

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Dataset delivered to Navy	Low	Dataset Integrates with Navy AI Algorithms in Lab Environment	5	4th QTR FY25
At sea testing one target	Medium	Targets detected in non weather and rain environment	7	3rd QTR FY26
At sea testing multiple targets	Medium	Multiple targets detected in weather and cluttered environments	8	1st QTR FY28

HOW

Projected Business Model: Arcarithm sells high-quality, labeled computer vision image datasets to DoD and defense contractors. Using ImageBrew internally, we generate realistic, metadata-rich synthetic and augmented images tailored to mission needs. We offer curated datasets and on-demand generation services, partnering with primes for integration into fire control and threat detection systems. This data-as-a-product model supports recurring revenue and meets DoD AI training data demand.

Company Objectives: Arcarithm's objective is to become a leading provider of high-fidelity, metadata-rich computer vision training datasets to the Department of the Navy and broader DoD AI systems. By leveraging our ImageBrew technology, we accelerate the development and deployment of automated target detection, classification, and tracking systems.
We will support this goal by: Supplying mission-specific datasets to Navy, Marine Corps, and defense prime contractors. Building long-term partnerships with programs requiring AI/ML-based situational awareness and fire control capabilities

Potential Commercial Applications: Key markets include:
Autonomous Vehicles: Generation of edge-case training datasets for object detection in varying environmental conditions
Industrial Robotics: Dataset creation for machine vision in manufacturing, assembly, and quality inspection processes
Security and Surveillance: Training imagery for AI-enabled perimeter monitoring, threat detection, and anomaly recognition
Agriculture: Precision farming applications such as crop/animal detection and yield estimation from drone imagery

Contact: Randy E. Riley, President/CEO
randy.riley@arcarithm.com   (256) 763-8781