

WHO

SYSCOM: NAVSEA

Sponsoring Program: NAVSEA PEO USC

Transition Target: Optional, Large and Medium Unmanned Surface Vessels

TPOC: (561) 866-2001

Other Transition Opportunities: Maritime Autonomous Surface Ships (MASS),any manned ships that need perception for enhancing situational awareness with minimum crewed watch stander.

Notes:



WHAT

Operational Need and Improvement: The USV at the heart of the Unmanned Influence Sweep System (UISS) is required to follow Navigation Rule 5: “Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.” The focus of this topic is to develop an innovative optical sensor and processor subsystem for the total perception processing system. The optical subsystem will provide a continuous 360 degree field of view along with PTZ camera, process the raw data and provide detections, track-id and classification information as an output to an operator or an onboard autonomous control system sufficient to support situational awareness of the environment.

Specifications Required: Topside sensor: size <= 4sq/ft, weight<=30lb.; Below-deck: size <= 2 sq/ft, weight<=10lb.; Power: 24Vdc vehicle power IAW MIL-STD-1275, at 30 amps maximum.

Technology Developed: Consisting of a 360° pancam IR camera, a pan-tilt-zoom camera, processor and advanced software technologies, UtopiaCompression's (UC) passive perception system will provide unparalleled vision-based Situational Awareness (SA) to USVs and their operators. Using panoramic imagery, our system automatically detects and tracks surface contacts on the water. It then slews and cues the PTZ camera to the objects of interest and classifies them. These capabilities will satisfy Navigation Rule 5 and support collision avoidance and autonomous navigation.

Warfighter Value: UC's passive perception system will provide the Navy Warfighters with substantially improved 360° real-time visual situational awareness, capable of satisfying the Navigation Rule 5, enabling automous and semi-autonomous operation. In manned and semi-autonomous operations, UC's IVS system will enable automated processing to reduce the workload of operators; substantially improve accuracy via reduced human error and fatigue; will enable operators to operate multiple vehicles simultaneously, and will reduce labor costs.

WHEN

Contract Number: N68335-20-G-2011 **Ending on:** Oct 30, 2023

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Algorithm Development	Low	Validated	3	TBD
Hardware Interfaces	Low	Validated	4	TBD
Boat Tests	Medium	Validated more tests are required	6	TBD
OUSV Integration	Medium	Yet to be Validated	8	TBD

HOW

Projected Business Model: UC will license the passive perception software to Government and Prime customers for integration into USV platforms and maritime systems with existent camera systems. The passive perception software will also be licensed to commercial camera system vendors for inclusion in maritime navigation systems. UC will provide custom application services to conform the software with specific customer classification requirements.

Company Objectives: UC will further develop the passive perception software to function within a variety of camera configurations, in conjunction with additional sensor types, and in different environments. This will position the our technologies to operate in a broad range of vessels with varying Size, Weight And Power (SWaP) constraints, creating a much broader customer base. The addition of new functional environments will also increase the potential custom modification services offered by UC.

Potential Commercial Applications: UC's IVS technologies offer significantly superior detection, tracking and unparalleled classification capabilities to customers in maritime environments, substantially improving situational awareness to manned, semi-autonomous, and autonomous systems. The IVS system has immediate application to Maritime Autonomous Surface Ships (MASS), and there is substantial commercial potential for the passive perception software technologies in maritime navigation systems and mobile camera applications.