

Topic: N131-079

Analysis, Design & Diagnostics, Inc.

Compact Off-board Passive Target-Discriminator

The technology consists of a low power, wideband sensor node (300 kHz) with a four hydrophone planer array in a star configuration. The sensor node runs automated detection and classification algorithms which are capable of detecting and classifying vessels of interest while at the same time recording the data to support verification and validation. The four hydrophone planer array also supports bearing estimation in both azimuth (AZ) and declination elevation (DE). The sensor can be readily modified to support a wide variety of Detection, Classification and Localization (DCL) requirements and is ideally suited as a sensor package for UUVs or other manned/unmanned platforms. Possessing a unique knowledge of undersea acoustics in complex marine environments, this company seeks relationships with platform developers for sensor integration and testing.

Technology Category Alignment:

None

None

None

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SYSCOM: ONR

Contract: N00014-14-C-0176

Department of the Navy SBIR/STTR Transition Program

STATEMENT A. Approved for public release; distribution is unlimited. ONR

Approval # 43-1256-16

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Compact Off-board Passive Target-Discriminator

Analysis, Design & Diagnostics, Inc.

WHO

SYSCOM: ONR

Sponsoring Program: ONR Code
32 - Ocean Battlespace Sensing
Department

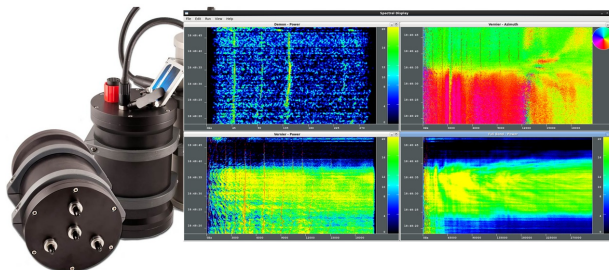
Transition Target: Advanced
Undersea Weapons Systems

TPOC:

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Other transition opportunities:

The wideband, low power autonomous sensor node is ideally suited for Unmanned Undersea Vehicles (UUVs) or Autonomous Undersea Vehicles (AUVs) to detect and vessels of interest. This technology could also be back-fit onto existing submarine and surface ship platforms to provide improved situational awareness and automate the detection, classification and localization of vessels of interest.



Sensor Node and Automated Processing

WHAT

Operational Need and Improvement:

Acoustic Sensor Node for the Advanced Undersea Weapons System

Specifications Required:

A Low Power, Long-Life autonomous Acoustic Sensor Node that has the capability to automatically detect, classify and localize (DCL) vessels of interest.

Technology Developed:

A Low Power Wide Band autonomous Sensor Node with Automated Detection and Classification Algorithms

Warfighter Value:

The acoustic sensor node developed under this program will support the Advanced Undersea Weapons System. The sensor node can also be employed independently to collect wideband acoustic intelligence on vessels of interest.

WHEN

Contract Number: N00014-14-C-0176

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|----------------------------------|------------|------------------------------------|------------|--------------|
| Develop Prototype Sensor Node | Med | Ability to collect real-world Data | TRL 7 | October 2014 |
| Develop Automated DCL Algorithms | Med | Pd/Pcc/Pmc/Pcc | TRL 7 | May 2016 |
| AUWS Modeling & Testing | Med | Duration/ Area Coverage | TRL 7 | June 2016 |
| AUWS Exit Demonstration | Med | Auto DCL | TRL 7 | July 2018 |

HOW

Projected Business Model:

Analysis, Design & Diagnostics, Inc. will produce the hardware, software and detection algorithms for prototype and testing of the Acoustic Sensor Node. Analysis, Design & Diagnostics, Inc. has the capability for low rate production. For mass quantities the technology will be licensed to production partners with well-established lean manufacturing processes to drive down per unit costs.

Company Objectives:

Our objective is to be the provider of the Acoustic Sensor Node for the AUWS program. We want to support maintenance and upgrade to the algorithms as the vessels of interest change and as new Acoustic Intelligence is obtained.

Potential Commercial Applications:

The acoustic sensor node can be used for multiple commercial applications. The high frequency bandwidth of this sensor exceeds other known sensor bandwidths making it unique with regard to underwater acoustic monitoring. The sensor can be used in the automated detection, classification and localization mode or in a record only mode. The sensor can be readily modified to support a wide variety of acoustic monitoring applications. The four hydrophone array supports bearing estimation to acoustic emitters. The wideband sensor can be easily modified to support any desired sample rate. More importantly, this same sensor can be modified to support automated detection and classification of any acoustic emission. Applications include: harbor/port/vessel security, marine mammal detection and mitigation as well as abundance and density estimates of marine mammals.

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