

“Brainlike” Auto-Adaptive Technology for Undersea Surveillance

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Abstract

Many Navy programs are seeking ways to automate and simplify the process of identifying unexpected undersea activity in a sea of change. Examples of recent RFPs include NAVAIR’s Air-Deployed Multi-Sensor Search Optimization Sonar Automation Technology and ONR’s Automated Processing For Distributed Undersea Sensor Systems, within corresponding Common Undersea Picture and Sensor Automated Technology Programs. Recent HSARPA programs for littoral surveillance also abound. At the same time, with modern advances in real-time C4ISR, FORCEnet, sensor systems, and automated signal-processing technology, great reductions in ASW total operating costs are becoming feasible. For these reasons, the time is right for redirecting ASW toward simplified, automated target recognition. This presentation will describe an auto-adaptive system that advances undersea surveillance by recognizing non-target background effects automatically, updating them continuously, and removing them effectively. With background clutter effectively removed, nearly all that remains is unexpected activity, and it shows up clearly. As a result, fewer operators can monitor expanded regions more effectively, and data fusion algorithms can produce better situational awareness more simply. The system is called “Brainlike” because it adjusts background expectations continuously and automatically, much like animals habituate to background stimuli in order to notice novelty more clearly. Undersea surveillance platforms with “Brainlike inside” offer huge overall savings to the Navy, through substantial staffing, training, false alarm, and intrusion reductions.



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