NDIA
AT THE HEART OF THE MISSION

2020
UNDERSEA WARFARE
VIRTUAL CONFERENCE

September 22 – 23 | NDIA.org/VirtualUSW

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WHO WE ARE

The National Defense Industrial Association is the trusted leader in defense and national security associations. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA's membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. For more information, visit **NDIA.org**

UNDERSEA WARFARE

WHO WE ARE

NDIA's Undersea Warfare Division fosters both the exchange between government and industry of technical information and the expansion of research and development in areas related to undersea warfare. To this end, the Division furthers communication by providing a variety of ways for government and industry to work together to solve problems, identify affordable solutions, and meet specific requirements. The Division also supports both government and industry by providing advice on undersea warfare policies and acquisition planning.

LEADERSHIP AND COMMITTEES

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- Combat and Weapons Control
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- Submarine Acoustics
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The Serco Team continues to play a role in every major U.S. Navy submarine program. With over 40 years of unparalleled experience in total integrated ship design, Serco works across all major ship platforms including submarines, USVs, and UUVs.

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The Serco Team builds on decades of research and development, science and technology, and core engineering capabilities to continue to solve the toughest problems in naval architecture, marine engineering, operational support, modeling and simulation, power generation, and other mission-critical areas.

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WELCOME TO THE 2020 UNDERSEA WARFARE VIRTUAL CONFERENCE

I welcome all of our virtual attendees to the National Defense Industrial Association's 2020 Undersea Warfare Virtual Conference. The NDIA Undersea Warfare (USW) Division members have worked hard to accommodate the COVID-19 restrictions and are proud to bring you this annual conference in a virtual format.

This conference concentrates on the Navy's core mission of countering submarine and mine threats to the free and open flow of seaborne commerce as well as to the conduct of power projection from the sea. All Navy platforms and elements of the Navy force structure are involved in undersea warfare: submarines, surface combatants, fixed- and rotary-wing aircraft, surveillance units, and the Navy's command and control infrastructure. There are six active Technical Committees through which the Division focuses on the Navy's mission areas: Undersea Sensors, Mine Warfare, Undersea Vehicles, Aviation, C4I and Combat Systems, and Warfighter Performance. The technical sessions on the second day of the conference focus on recent events, advancements, and challenges in each of these mission areas.

The mission of the NDIA Undersea Warfare Division is to focus on critical undersea warfare areas related to the development, production, testing, and logistic support of underwater combat systems. Such areas include mines, torpedoes, manned and unmanned underwater vehicles, countermeasures, sensors, weapon control and handling equipment, and the integration of systems aboard aircraft, ships, and submarines.

NDIA's Undersea Warfare Division fosters both the exchange between government and industry of technical information and the expansion of research and development in areas related to undersea warfare. To this end, the Division furthers communication by providing a variety of ways for government and industry to work together to solve problems, identify affordable solutions, and meet specific requirements. The Division also supports both government and industry by providing advice on undersea warfare policies and acquisition planning.

Your feedback is highly encouraged to ensure we continue to meet your needs.

Sincerely,

CAPT Robert Dunn, USN (Ret)
Chair, Fall Conference, Undersea Warfare Division, NDIA
Senior Strategy and Business Development Manager,
General Dynamics Mission Systems

HARASSMENT STATEMENT

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.

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NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members: prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.

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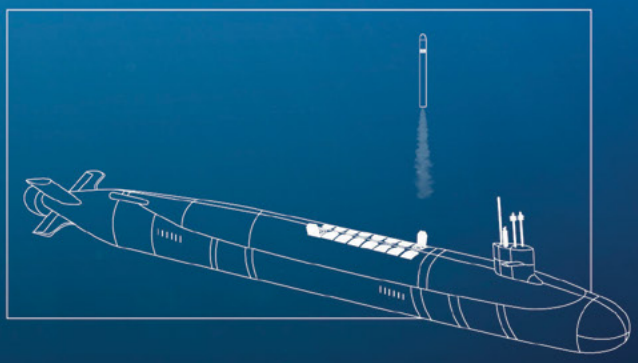

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GENERAL ATOMICS
ELECTROMAGNETICS

AGENDA

TUESDAY, SEPTEMBER 22

10:00 – 10:05 am

WELCOME AND OPENING REMARKS

Gen Hawk Carlisle, USAF (Ret)
President and CEO, National Defense Industrial Association (NDIA)

CAPT Robert Dunn, USN (Ret)
Chair, Fall Conference, Undersea Warfare Division, NDIA

10:05 – 10:35 am

SPEAKER REMARKS

ADM James Caldwell, Jr., USN
Director, Naval Nuclear Propulsion Program, Department of the Navy/Department of Energy

10:40 – 11:10 am

VADM Daryl Caudle, USN
Commander, Submarine Forces, U.S. Pacific Fleet

11:15 – 11:45 am

ADM Charles Richard, USN
Commander, U.S. Strategic Command

11:45 am – 12:15 pm

NETWORKING CHAT LOBBY BREAK

12:15 – 12:45 pm

SPEAKER REMARKS

RADM William Houston, USN
Director, Undersea Warfare Division, N97, Office of the Chief of Naval Operations

12:50 – 1:20 pm

RADM David Goggins, USN
Program Executive Officer, Submarines

1:25 – 1:55 pm

RADM Blake Converse, USN
Commander, Submarine Force, U.S. Pacific Fleet

2:00 – 2:30 pm

RDML John Okon, USN
Commander, Naval Meteorology and Oceanography Command

2:30 – 3:00 pm

NETWORKING CHAT LOBBY BREAK

Sponsored by Peraton

3:00 – 3:30 pm

SPEAKER REMARKS

RADM Lorin Selby, USN
Chief of Naval Research and Director of OPNAV N94, Office of Naval Research
Prerecorded

3:35 – 4:05 pm

Keynote Speaker

Hon. James "Hondo" Geurts
Assistant Secretary of the Navy for Research, Development & Acquisition, U.S. Navy

4:10 – 4:40 pm

RDML Scott Pappano, USN
Program Executive Officer, Columbia


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4:45 – 5:15 pm

RDML Kevin Byrne, USN
Commander, Naval Surface Warfare Center and Naval Undersea Warfare Center

5:15 – 5:20 pm

CLOSING REMARKS – ADJOURN

Gregg Bauer
Vice Chair, Undersea Warfare Division, NDIA

WEDNESDAY, SEPTEMBER 23

10:00 – 10:05 am

OPENING REMARKS – PROGRAM MANAGER SESSIONS

Mike Cortese
Chair, Undersea Warfare Division, NDIA

C4ISR

10:05 – 10:10 am

INTRODUCTORY REMARKS

Paul Rosbolt
Chair, C4ISR Session, Fall Conference, Undersea Warfare Division, NDIA

10:10 – 10:40 am

IWS 5.0 OVERVIEW

CAPT Jill Cesari, USN
Major Program Manager, Undersea Systems, IWS 5.0

10:45 – 11:15 am

EVOLVING UNDERSEA COMMUNICATIONS

CAPT David Kuhn, USN
Program Manager, Undersea Communications and Integration Program Office

11:15 – 11:35 am

NETWORKING CHAT LOBBY BREAK

Mine Warfare

11:35 – 11:40 am

INTRODUCTORY REMARKS

Jon Tobias
Chair, Mine Warfare Session, Fall Conference, Undersea Warfare Division, NDIA

11:40 am – 12:10 pm

LOOKING TO THE FUTURE BY LEARNING FROM THE PAST

Dr. James (Sam) Taylor
Senior Leader, Mine Warfare, PEO USC

12:15 – 12:45 pm

UNMANNED EXPEDITIONARY SYSTEM PORTFOLIO UPDATE

George Saroch
Deputy Program Manager, LCS Mission Modules Program Office (PMS 420)

12:45 – 1:15 pm

NETWORKING CHAT LOBBY BREAK

REMUS TECHNOLOGY PLATFORM

The common, core technology that drives reliability across REMUS UUVs.

Inside all REMUS UUVs, the REMUS Technology Platform is the common, core technology that provides consistent, reliable performance across the REMUS family of systems. This platform is scalable across all classes of UUVs, from small to extra-large. The REMUS Technology Platform brings together open architecture, advanced autonomy, and reconfigurable modular payload and energy sections to allow the user to tailor the UUV to their specific mission needs.

OPEN ARCHITECTURE AND ADVANCED AUTONOMY

The REMUS Technology Platform is built on DDS middleware, with the vehicle and mission control system designed to be Unmanned Maritime Autonomy Architecture (UMAA) compliant while maximizing Modular Open Systems Architecture (MOSA) principles. This enables more rapid integration of sensors and capabilities through spiral upgrades. The platform is built off of the core, field-proven REMUS autonomy, allowing for overlay of advanced autonomy behaviors such as advanced mission planning and collaborative autonomy. Hardware and software development kits accelerate third party sensor and algorithm integration, which decrease development costs and timelines.

MODULAR AND RECONFIGURABLE

The REMUS Technology Platform provides advanced modularity, allowing the user to choose the payloads and energy sections that best suit their mission requirements. Reconfigurable hull sections with standard interfaces allow for third party or government payload integration. Compact and efficient core electronics were redesigned with cutting-edge processing capability and lower power consumption. The platform also allows swappable energy modules, a removable hard drive for rapid exfiltration of mission data, and toolless band clamps. The advanced modularity of the REMUS Technology Platform allows for lower development and lifecycle costs with faster and simpler maintenance and upgrades.

ENGINEERED FOR RELIABILITY

The REMUS Technology Platform was designed with reliability as a central requirement. Over 20 years of operation with more than 500 units sold to military, commercial, and academic organizations worldwide have helped to refine both the hardware and software into a solid, dependable platform. Selection of quality components and adherence to rigorous manufacturing and testing standards produce REMUS vehicles ready to endure the harsh operating environments where users need them.

Hydroid is now a part of Huntington Ingalls Industries, Technical Solutions; bringing together the full range of UUVs. To learn more, visit:

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tsd.huntingtoningalls.com

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Undersea Vehicles

1:15 – 1:20 pm

INTRODUCTORY REMARKS

Tom Ruzic
Chair, Undersea Vehicles Session, Fall Conference, Undersea Warfare Division, NDIA

1:20 – 1:50 pm

UNMANNED VEHICLES: PMS 406 UPDATE

CAPT Pete Small, USN
Program Manager, Unmanned Maritime Systems, Program Executive Office for Unmanned and Small Combatants

1:55 – 2:25 pm

EXPEDITIONARY MISSIONS: PMS 408 UPDATE

CAPT Dan Malatesta, USN
Program Manager, Expeditionary Missions

2:30 – 3:00 pm

FLEET UPDATE

CAPT Lincoln Reifsteck, USN
Commander, Submarine Development Squadron FIVE

3:00 – 3:20 pm

NETWORKING CHAT LOBBY BREAK

Aviation Systems

3:20 – 3:25 pm

INTRODUCTORY REMARKS

Glen Sharpe
Chair, Aviation Systems Session, Fall Conference, Undersea Warfare Division, NDIA

3:25 – 3:55 pm

NAVAIR PMA-264 UPDATE

CAPT Dan Papp, USN
Program Manager, Air Anti-Submarine Warfare Systems Program

Undersea Sensors

4:00 – 4:05 pm

INTRODUCTORY REMARKS

Joe Cuschieri
Deputy Chair, Undersea Sensors Session, Fall Conference, NDIA

4:05 – 4:35 pm

ONR PERSPECTIVE ON UNDERSEA SENSORS

Dr. Fletcher Blackmon
Deputy Team Lead, Office of Naval Research Maritime Sensing ONR321MS

4:35 – 4:40 pm

CLOSING REMARKS – ADJOURN

Gen Hawk Carlisle, USAF (Ret)
President and CEO, NDIA

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ON-DEMAND TECHNICAL SESSIONS

The "On Demand" feature gives you access to bonus content and handouts to view at your own convenience. Accessing these on-demand presentations from the virtual conference allows you to gain additional valuable insights from the undersea warfare community.

AVIATION SYSTEMS

MQ-9B SeaGuardian Anti-Submarine Warfare

Peter Yelle
Strategic Development Manager,
General Atomics Aeronautical Systems

The MQ-9B SeaGuardian with its anti-submarine warfare (ASW) payload offers a unique maritime operational capability inherent in no other Unmanned Air System (UAS). The ability to deploy and monitor sonobuoys autonomously from a medium altitude, long endurance UAS significantly enhances remote submarine detection and tracking and at a significantly reduced cost over manned platforms for U.S. Maritime Component Commanders and partner nations.

C4ISR

Improving Data Interference Quality and Analytics with Trusted Provenance and Systems Interoperability

Eleanor Mitch
CEO and Founder, 14BIS Supply Tracking

The safety and success of every Navy mission relies on quick, reliable access to the right data for decision-making. But key systems challenges—inadequate asset authentication, insecure data and systems that grow increasingly complex and disparate—are causing vulnerabilities, fueling delays and compromising safety. Technological advances may be used to improve big data multimodal data fusion, integrity and decision-making.

Ethical Control of Unmanned Systems

Donald Brutzman
Naval Postgraduate School

Lethality requires an ethical and legal basis for armed conflict, supervised by military teams. Well-structured executable robot tasking using mission goals and constraints can resemble tactical tasking of humans afloat. Careful application of Semantic Web technology makes syntactic verification, semantic validation and ethical control of unmanned systems feasible.

Remote Function Select, an Extensible Self-Describing Command and Control Interface for Deployable Systems

Dr. David Powell
CTO and Chief Engineer, Sparton Deleon Springs LLC

Remote Function Select (RFS) forms the basis for a suite of technologies providing a lightweight command, control and communications capability for use in deployable systems such as sonobuoys, cross-domain communication gateway buoys, micro UAVs, etc. RFS is an extensible, self-describing protocol allowing the host command and control system discovery of all configurable settings on the RFS-enabled device without having any a-priori knowledge of the device. This capability provides significant cost benefits and speeds the introduction of new technologies and capabilities to the fleet.

Evolving Undersea Communications

Ron Jones
Deputy Program Manager and Subject Matter Expert,
OpalSoft NUWC Keyport Support Service

Anthony Niznik
Senior Director, Projects, OpalSoft NUWC Keyport Support Service

Presenting a concept to implement virtualization for Naval C4I systems.

Zero Trust Networks: From Principles to Practice

Daniel Moniz
Technical Staff, Naval Undersea Warfare Center

Zero trust networking is a security concept that is gaining greater interest in both the commercial and military sectors as a more effective approach than traditional perimeter security techniques. While the concepts and goals of zero trust networking are well described, there has been little guidance or description available about how to deploy these techniques. This presentation will outline zero trust concepts and examine the protocols and software that can be used to deploy them.

Model Based Systems Engineering in the Product Support Environment

Lucas Marino
Integrated Logistics Support Manager/Product Support Strategist

Dr. Kaitlynn Castelle
Life Cycle/Product Support Strategist

Applications of model based systems engineering (MBSE) provide a more capable support system for the future warfighter. Digital models of vessels will integrate with robust and centralized repositories of engineering and logistics data to improve maintenance planning, supply chains, and the operational and materiel availability of the nation's most critical seagoing assets.

COMBAT SYSTEMS

Data Analytics for Predictive Maintenance in an Industrial Environment

Jonathan Hahn
Senior Data Scientist, World Wide Technology, Inc.

Utilizing Operational Exercises for the Conventional Prompt Strike Program to Develop Prototypes to Rapidly Transition Capabilities to the Warfighter

Matthew O'Connell
Payload Systems Engineer, NUWC NPT

The Conventional Prompt Strike program is a top priority within the Department of Defense to develop hypersonic missile capability and deploy to the warfighter before our adversaries. Using fleet operators and real world scenarios, prototypes are developed to inform requirements, evaluate concepts of operations, and transition capability rapidly to tactical systems. This discussion topic outlines the process and insertion points that can be applied to acquisition programs in order to deliver systems on schedule and within budget.

MINE WARFARE

Counter-UUV Systems

Matthew Searle
Chief Technology Officer, Maritime Arresting Technologies

The advance of unmanned underwater vessel technology makes the possibility of encountering self-propelled smart mines much more likely. A lot of attention has been given to defeating UAVs and autonomous surface vessels but we can't overlook the threat from below.

UNDERSEA SENSORS

Effects of Acceleration and Maneuvering of a Submarine on the Dynamics, Persistence, and Detectability of its Wake

LT David Kramer, USN
Naval Postgraduate School

In order to counter increasingly quiet adversarial submarines as well as understand the vulnerabilities to non-acoustic methods of detection for allied submarines, the Naval Postgraduate School is utilizing numerical simulations to analyze the effects of acceleration and maneuvering on the dynamics and thermodynamic signatures of sub-surface wakes. Such maneuvers create clearly identifiable changes and asymmetries in the wake field, which we characterize by its magnitude, width, and duration.

Standards for Subsea/Seabed Warfare Systems

Chelsea Meggitt
Oceanetics, Inc.

Dallas Meggitt
Sound & Sea Systems, LLC

The successful integration of disparate subsea and seabed warfare (SSW) technologies and systems will depend to a significant extent on the development and utilization of a broad range of standards to define interfaces, communications, power and related elements of these systems. Many SSW concepts and systems utilize various configurations of Undersea Distributed Networks (UDNs) as an integral part of the overall system concept. This presentation discusses the need for, and development of standards applicable to UDNs for SSW.

Research in Non-Linear Applications

Richard Katz
Senior Research Engineer, Naval Undersea Warfare Center

Dr. Dirk Huges
Senior Research Engineer, Naval Undersea Warfare Center

This research summarizes advancements performed at NUWC-NPT in nonlinear acoustics for Navy and commercial (dual-use) applications.

Update on Aluminum-Water Energy Modules for Static & Dynamic Applications

David Porter
General Manager, L3 Open Water Power

Andrew Jesmain
Senior Manager, Business Development, L3 Harris

Don Aubrecht
Director, Systems Engineering, L3 Harris

OWP is maturing and de-risking a variety of core and supporting technologies related to aluminum-water (Al-H2O) batteries for UUVs and subsea and seabed warfare (SSW) systems—e.g. sensors, C2—that offer the safety, endurance, and longevity at deep ocean depths to transform current undersea warfare concepts of operation. OWP will update USW Virtual Conference attendees on its recent advances in UUV endurance, sea-bottom deployment of static energy modules, and dormancy.

ML-PDA and ML-PMHT Comparison for Estimating VLO Targets in Multipath Underwater Environment

Dr. Peter Willett
Professor, Electrical & Computer Engineering,
University of Connecticut

Christopher Franzini
University of Connecticut

Francesco Palmieri
University of Connecticut

Yaakov Bar-Shalom
Board of Trustees Distinguished Professor & Marianne E. Klewin Endowed Professor of Engineering, University of Connecticut

We compare two approaches to target detection and parameter estimation in a Very Low Observable (VLO) underwater multipath environment, and two methods: Maximum Likelihood Probabilistic Multiple Hypothesis Tracking (ML-PMHT) and Maximum Likelihood Probabilistic Data Association (ML-PDA). The two approaches differ in their multi-path data association philosophies and models, with the latter more precise but much more demanding in computation. Is the performance worth the cost? This work is part of ONR's NIUVT program at UConn and URI.

UNDERSEA VEHICLES

Active Terrain Aided Navigation

Darren Kurt
Nuclear Submarine Officer, U.S. Navy

Active Terrain Aided Navigation (ATAN) is a new approach for conducting accurate navigation without reliance on external beacon systems. It is an information theoretic software framework that seeks the dual purpose of ensuring complete coverage of a designated area while minimizing positional estimation errors. The approach uses a near-real time Artificial Intelligence Reinforcement Learning approach that results in a dynamic trajectory optimization that balances Exploration and Exploitation mission objectives. This talk will present an overview of the approach that will include simulated initial results.

Submarine Auxiliary Waterjet Propulsion

LT Benjamin MacFarland, USN
Student, Mechanical Engineering, Naval Postgraduate School

Dr. Walter Smith
Consultant, Propulsion, Gas Turbine, and Energy Evaluations, LLC

Many underwater vehicles draw sea water in and out for various reasons, such as cooling hot equipment or sampling sea water. The inlets and outlets are typically normal to the hull (i.e. the flow is exiting athwartships, rather than aft). This is wasted flow energy that could be used to propel the ship. A stationary device could be placed on the outlet to both redirect and nozzle the flow, in effect turning the sea water flow into a form of waterjet propulsion. Very little research has been done regarding waterjet propulsion for underwater vehicles. Research has been done determining the nozzle outlet diameter that maximizes thrust based on the pump being used, as well as the most efficient nozzle shape. These are for conventional waterjet propulsion systems on surface ships, which use an axial pump, but the principles can still be applied to this study. Research has also been conducted for surface ship waterjet propulsion on interactions of the waterjet system with the hull of the ship. This will be applicable to this topic, since higher velocity fluid will be exiting the nozzle and will interact with the hull, yielding excessive drag. The use of an ejector will also be investigated to maximize propulsion.

The main objective of this thesis is to investigate the feasibility of redirecting and nozzling the sea water flow, from athwartships to aft, using available excess energy from the ship to provide a useful means of emergency/auxiliary propulsion. In support of this, a secondary objective will be to determine the most efficient design to both redirect the flow, roughly ninety degrees, while nozzling the flow to maximize propulsion. This method of auxiliary propulsion will attach stationary devices to the Main Sea Water outlets to both redirect and nozzle the flow to provide useful propulsion. This has not been attempted before. I think it will work due to the fact that the Main Sea Water Pumps require roughly the same amount of electrical power as the outboard, which can be used for propulsion in emergencies. The devices are designed to maximize thrust while minimizing head loss in order to help meet cooling requirements of the system.

These devices will allow submarines to have an auxiliary form of propulsion in the event of a casualty that precludes use of the propeller/propulsor. Secondly, in the event of an attack to the stern of the ship (i.e. torpedo exploding near the propeller), the outboard could also be unusable due to its close proximity to the propeller. Since these devices are not near the propeller, they could still provide propulsion for the ship. Thirdly, since SSBNs typically patrol at very slow speeds, these devices could provide a method for them to routinely patrol without use of the propeller/propulsor. Lastly, if unmanned undersea vehicles are ever propelled by nuclear power in the future, these devices could be used as the sole means of propulsion, rather than requiring main engines, a shaft, and a propeller. All of these applications support the mission of Integrating Subsea/Seabed Warfare Capabilities by providing an alternate method of low speed propulsion for both large and small underwater vehicles.

In the interest of keeping my thesis UNCLASSIFIED, the majority of the research is done using the DARPA SUBOFF model. Assumptions were made to determine the Main Seawater System design flowrate, so that attainable speed could be determined. Multiple sized devices were designed in Solidworks, and Computational Fluid Dynamics (CFD) simulations were run in ANSYS-CFX. A SECRET portion of the thesis will be conducted, using a Virginia-Class Submarine.

Research in this topic is still fairly new. An analytical solution has been completed. All CFD simulations, both UNCLASSIFIED and SECRET, will be complete in time for the NDIA conference, and an experiment will most likely be conducted to validate the CFX models.

The results of all CFD simulations run up to this point yield an attainable speed of approximately 10 kts for the SUBOFF model. These simulations do not include use of an ejector, which will augment the thrust of these devices. I expect all further CFD results and experimental data to agree with this, for the SUBOFF model. I do not expect speeds in excess of 5 kts for simulations run using the Virginia Class Submarine. Even if only 5 kts is attained, this is still a useful speed, especially considering that it is attained without use of the propulsor.

Mission Autonomy Architecture for Unmanned Maritime Vehicles

Dr. Arjuna Balasuriya
Senior Scientist, Charles River Analytics

Bryan Loyall
Principal Scientist and Director of Technology Innovation, Charles River Analytics

Ross Eaton
Senior Scientist, Charles River Analytics

Derek Theyer
Vice President, Decision Management Systems, Charles River Analytics

A novel mission autonomy architecture for unmanned maritime vehicles. Discussion on the architecture and implementations on three types of unmanned maritime vehicles.

VALOR ROV: Reaching Beyond its Class to Change the Way We Keep Our Waters Safe

Alasdair Murrie
Head, Remotely Operated Vehicles Sales, Seatronics Inc.

VALOR reaches well beyond its class, harnessing its small form factor and unrivaled power and payload capabilities to provide flexibility and adaptability to whatever scenario is presented. It also provides the user with one of the most capable Mine Identification & Destruction System (MIDS) available, in addition to multiple other Defence & Security applications. Additionally, VALOR can be fitted with NBC detection sensors, magnetometer, P.A.N Disruptor for mine or IED neutralization and fitted with manipulator arms for delivery of UXO placement charges, etc.

Demonstrating the Effects Web of Non-Conventional UUVs in the "Last Mile," with Implications for the Gray Zone

David Shane
Technical Program Manager and Business Development Lead, Advanced Systems Group, Boston Engineering Corporation

Boston Engineering's non-conventional underwater vehicles can transform traditional UUV tasking based upon vehicle maneuverability and ease of payload integration and deployment, providing a range of potential effects in the "last mile." In this brief, we review these non-conventional UUVs, our next generation profiling devices, the collaboration between the two in a VSW OPAREA, and provide a preview of a demonstration thereof (our own small ANTX) to follow later this year.

WARFIGHTER PERFORMANCE

The Team-Based Advanced Resilience Accelerator (TARA) System: A Tablet-Based Observational Performance Asset Tool that Streamlines the Training Process and Enhances the Development of Resilient Teams

Dr. Lisa Lucia
Aptima, Inc.

Kristy Kay
Scientist (I/O Psychologist), Aptima, Inc.

Jeffrey Beaubien
Distinguished Principal Scientist and IRB Chair, Aptima, Inc.

Resilient teams are critical for safe and effective submarine operation and, more broadly, for multi-domain mission performance and readiness. The Team-Based Advanced Resilience Accelerator (TARA), a tablet-based observational performance assessment tool, was developed for Naval Submarine Base New London's Submarine Learning Center for use in their piloting and navigation simulation trainer. Currently under evaluation by end-users (instructors and trainees), TARA is expected to reduce the administrative and cognitive burden on instructors, improve the team training processes, and ultimately result in enhanced development of resilient teams.

The views of the author expressed herein are do not necessarily represent those of the U.S. Navy or Department of Defense (DoD). Presentation of this material does not constitute or imply its endorsement, recommendation, or favoring by the DoD.

Our Pride Runs Deep: A Virtual Showcase of the Naval Submarine Medical Research Laboratory (NSMRL)

Dr. Ben Lawson
Technical Director, Naval Submarine Medical Research Laboratory

This presentation will be a guided tour of the Naval Submarine Medical Research Laboratory (NSMRL). The guided virtual tour will include brief presentations and demonstrations of important knowledge and materiel products the laboratory develops to support submariner and diver health and performance.

AI Models of Humans to Support Human-Machine Teams

Dr. Alexander Stimpson
Chief Scientist, ASSETT

Future Human-Machine Teaming paradigms leveraging AI-based intelligent team members will require the AI agents to have some understanding of the capabilities, goals, and situational understanding of their human counterparts to promote trust and team performance. This research examines the strategies for developing AI models of human operators in computer-based environments to enable AI-based team members improved understanding, flexibility, and responsiveness to other team members.

WE SADLY NOTE THE PASSING OF MIKE JANIK ON AUGUST 3, 2020.

Mike Janik was a passionate leader, role model, and outstanding expert in the undersea technology community. He was a long-time contributor to the work of the NDIA Undersea Warfare Division.

A consummate professional, he selflessly served as the technical chair of the Undersea Sensors section. Mike was considered by all to be a mentor and guide in a world of complex systems and rapidly changing technology. Friendly, engaging, magnanimous and focused on excellence, he will be sorely missed.

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KEYNOTE SPEAKER BIOGRAPHY

HON. JAMES "HONDO" GEURTS

Assistant Secretary of the Navy for Research, Development & Acquisition
U.S. Navy

On Dec. 5, 2017, Mr. James Geurts was sworn in as Assistant Secretary of the Navy for Research, Development & Acquisition (ASN (RD&A)), following his confirmation by the Senate November 2017. As the Navy's acquisition executive, Mr. Geurts has oversight of an annual budget in excess of $60 billion and is responsible for equipping and supporting the finest Sailors and Marines in the world with the best platforms, systems and technology as they operate around the globe in defense of the Nation.

Mr. Geurts previously served as the Acquisition Executive, U.S. Special Operations Command (USSOCOM), at MacDill Air Force Base (AFB), Florida, where he was responsible for all special operations forces acquisition, technology and logistics. In this position his innovative leadership and technological ingenuity provided rapid and affordable acquisition that positively impacted the USSOCOM acquisition work force and the special operations forces capability on the battlefield.

These contributions were recognized by both private and public institutions during his tenure to include earning the Presidential Rank Award, USSOCOM Medal, William Perry Award and Federal Times Vanguard Award for Executive of the Year.

Prior to Senior Executive Service, Mr. Geurts began his career as an Air Force officer where he served as an acquisition program manager with engineering and program management leadership positions in numerous weapon systems including intercontinental ballistic missiles, surveillance platforms, tactical fighter aircraft, advanced avionics systems, stealth cruise missiles, training systems and manned and unmanned special operations aircraft.

He has over 30 years of extensive joint acquisition experience and served in all levels of acquisition leadership positions including Acquisition Executive, Program Executive Officer and Program Manager of Major Defense Acquisition Programs.

Mr. Geurts is a distinguished 1987 ROTC graduate from Lehigh University where he received a Bachelor of Science in Electrical Engineering. He holds a Master of Science in Electrical Engineering from Air Force Institute of Technology, Wright-Patterson AFB and in National Security Resourcing from Industrial College of the Armed Forces, National Defense University, Washington, D.C. Mr. Geurts also attended executive leadership and international studies programs at Harvard Kennedy School and George Washington Elliot School.

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