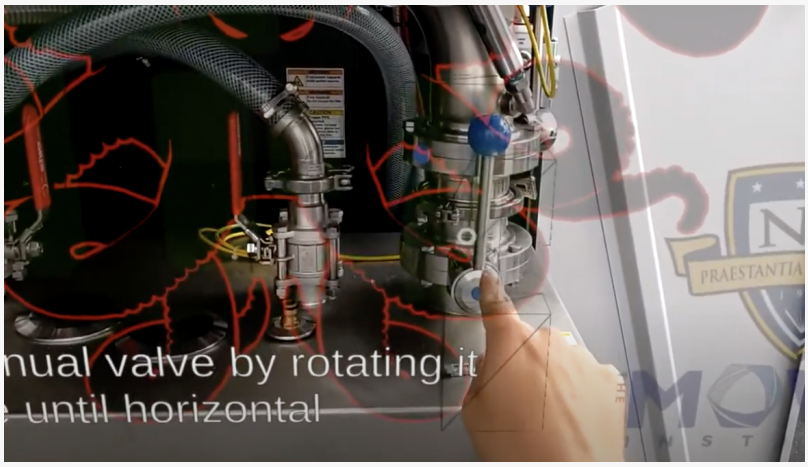
Naval Postgraduate School Foundation invests $145K in defense research of critical technologies and education programs

The NPS Foundation funds research projects that accelerate the adoption of new capabilities into the Naval services and the broader Department of Defense.



The Fifth Generation Maintainer project explores the use of augmented reality to support maintenance processes, documentation and quality assurance across the Naval enterprise.

MONTEREY, CALIFORNIA, UNITED STATES, November 8, 2022 /EINPresswire.com/ -- The Naval Postgraduate School Foundation recently invested a total of $145,000 in defense research projects and education programs led by Naval Postgraduate School faculty that support the exploration and application of critical emerging technologies for national security.

“Our Defense Innovation Fund and Seed Program allow private funding to quickly and directly propel innovation in the Department of Defense and catalyze partnerships between industry, academia and government,” said Karen Hargrove, NPS Foundation Trustee and chair of the Foundation’s Funding Committee. “The myriad of threats facing our nation are diverse and complex. We must work together to advance our national security in the face of new and evolving challenges.”

The Naval Postgraduate School Foundation uses a competitive, venture capital funding model to select SEED and Seedling projects that are at the forefront of responding to the new threats facing our country. Earlier this year, the NPS Foundation invested $625,000 in research and facility enhancements though the Foundation’s Defense Innovation Fund. This second round of funding for 2022 supports Naval Postgraduate School priorities and accelerates the adoption of new capabilities into the Naval services and the broader Department of Defense.

The Foundation provided $75,000 in Seedling funding to support the Fifth Generation Maintainer project, led by Dr. Imre Balogh and the NPS MOVES Institute, which explores the use of

augmented reality to support maintenance processes, documentation and quality assurance across the Naval enterprise. The research team already has two patents granted, with seven more in process, and is working with a number of Naval Warfare Centers. The funding supports the continued research and development of processes and technologies that are adaptable, scalable, and resource efficient.

The Mobile CubeSat Command and Control (MC3) ground station site at the Naval Postgraduate School.

The following seven projects received $10,000 each in SEED funding:

• Leveraging Commercial Capabilities for Spacecraft Design, under the direction of Dr. Wenschel Lan, will explore the use of current national technical means (NTM) systems using disaggregated assets to provide improved timing accuracy in support of space and distributed maritime operations. NPS' Small Satellite Lab aims to collaborate with TrustPoint to develop a payload prototype and design a spacecraft mission to investigate the feasibility and fidelity of this cutting-edge technology against ground-based timing sources.

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>
> *Karen Hargrove, NPS Foundation Trustee, Funding Committee Chair*

• Autonomous Small Satellite Ground Station Environmental Modeling, under the direction of Dr. Giovanni Minelli and Noah Weitz, will test autonomous data collection through monitoring hardware and machine learning algorithms on the Mobile CubeSat Command and Control (MC3) ground station site at NPS to improve situational awareness, reduce troubleshooting durations, and test and improve currently existing software and infrastructure within the space domain. This project also enables integration and testing of Microsoft's Azure Stack Edge hardware as part of the Cooperative Research and Development Agreement between NPS and Microsoft, further expanding machine learning capabilities at remote ground sites and in the cloud.

• Cryophones: Air Deployable Arctic ASW Sensors, under the direction of Ben Reeder and John Joseph, seeks to further develop a new type of air-deployed sensor that takes advantage of the acoustic propagation physics of ice to better support undersea warfare operations and enable novelty capabilities aligned with the U.S. Navy's 2021 Arctic Strategy, A Blue Arctic: A Strategic Blueprint for the Arctic.

• Building Education Programs from Required Competencies using AI, under the direction of Dr. Miriam Alves and Dr. Dennis Lester, seeks to specify an innovative approach to review and re-design inter- and multidisciplinary education programs using artificial intelligence and intelligence augmentation to adapt the education offerings to current and emerging warfighter's competency needs. This project supports the 78th Secretary of the Navy's strategic guidance "to develop leaders with the warfighting rigor, intellectual dynamism, and innovative creativity to maintain strategic advantage against competitors and global adversaries."

• Asynchronous Distance Learning for Naval Students, under the direction of Dr. Don Brutzman, focuses on course adaptation for asynchronous learning by Naval officers and NPS graduates, providing options for assessment and Distance Learning credit by prospective students, encouraging graduate study.

• Open-Source System Modeling Library, under the direction of Dr. Ray Madachy, seeks to further the open-source software Python Modeling Library (PyML) for wide adoption of engineers across disciplines in support of digital engineering practice, teaching and research in the DOD.

• Communication and Disinfection Lighting System, under the direction of Dr. Weilan Su, explores the development of a smart lighting system based on LEDs with UV and communication capabilities that simultaneously sanitize the air. This initial funding supports the development of a detailed research proposal and initial research.

In addition to supporting Naval Postgraduate School priorities, projects such as those exploring space systems technologies and undersea warfare technologies align with the DOD's Technology Vision, the Chief of Naval Operations NAVPLAN 2022 and the 2022 National Defense Strategy to increase collaboration with commercial partners to augment existing capabilities and foster rapid future capability employment.

"The SEED and Seedling funding from the NPS Foundation allows NPS to be highly flexible and responsive to emerging threats and innovative technologies. This support is critical to ensuring that we maintain a competitive advantage over our near-peer adversaries," said Dr. Kevin Smith, NPS Vice Provost for Research. "The opportunities provided by the NPS Foundation to engage and partner with industry has greatly expanded our capabilities. These relationships are recognized as mutually beneficial and provide a unique opportunity in support of the warfighter."

The NPS Foundation's Defense Innovation Fund moves projects from concept to capability by providing the initial investment to develop projects to the point where they can compete for federal spending. The SEED program uses a venture capital model to support research projects that address operational challenges and educational advancement. If the initial research shows sufficient progress and potential, those projects can become "Seedlings" and receive additional funding. The investment in early-stage research creates opportunities for the Naval

Postgraduate School to develop capabilities well before the military services uncover a vulnerability or opportunity. By funding early-stage projects, ideas from some of our nation’s brightest are transformed into scalable and world-changing solutions for defense, technology, energy, climate and more.

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