MSC NEWSLETTER – AUGUST/SEPTEMBER 2017

MSC and ADAC Announce Research Funding Opportunities! The Maritime Security Center has announced a Request for Proposals (RFP) for Maritime Security Research. The submission deadline is October 13, 2017. The RFP seeks proposals that address one or more of the following topic areas: 1). Maritime Risk, Threat Analysis, and Resilience; 2). Maritime Domain Awareness; 3). Maritime Technology, and 4). Integration of Science and Engineering with Maritime Security Governance and Policy. Visit the MSC website for more details: www.stevens.edu/MSC-RFP.

MSC's sister research center, the Arctic Domain Awareness Center (ADAC) has also recently announced a Request for Proposals. To learn more, please visit - ADAC MDA Request for Proposals.

Summer research students learn about homeland security operations in field-visits to USCG Sector Long Island Sound and CBP Field Operations at Port NY/Newark. Since early June, students in the Center's 8th annual Summer Research Institute (SRI) have been hard at work learning about and conducting research on areas of interest and concern to the homeland security domain. As part of the Center's summer research program, students are provided the opportunity to engage with and observe homeland security professionals operational environments, as they perform the work necessary to keep the Nation's homeland and Maritime Transportation System (MTS) safe from natural and man-made threats.
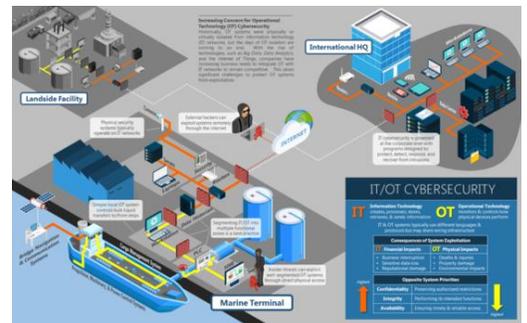
ABS to provide Maritime Cybersecurity Awareness Training and Resource Guide to U.S. Coast Guard. MSC research PIs, Cris DeWitt, Senior Technical Advisor from the American Bureau of Shipping (ABS) and Matthew Mowrer, Director, Applied Technology and Data Analytics from ABS Group are developing a series of virtual Maritime Cybersecurity Awareness training presentations for the USCG. These presentations are being developed to address the varying cybersecurity information/knowledge needs of Coast Guard personnel from Headquarters offices to Captains of the Port to Sector Prevention staff.

MSC/ABS research team discusses IT/OT systems, among other topics, in Maritime Cybersecurity Awareness Trainings and Resource Guide for U.S. Coast Guard.

The virtual trainings will cover topics including:

- Key U.S. government cybersecurity strategy and policy documents

- Basic understanding of information technology (IT) and operational technology (OT) systems and components

- Cybersecurity threats and forensic analysis of maritime-relevant cyber events

- Common vulnerabilities in maritime IT and OT systems

- Potential consequences of systems exploitation to business operations

- Available resources to implement and enhance cybersecurity programs

The research team is also developing a companion resource guide for USCG field personnel to review and share with vessel and port facility owners/operators as they develop and enhance their organization's cybersecurity plans and procedures. The virtual trainings and maritime cybersecurity companion guide will be made available to USCG personnel this fall.

Additional aspects of DeWitt and Mowrer's research, includes a multi-node analysis of critical points of failure within the cyber systems that support the Maritime Transportation System, as well as a framework for helping to shape cyber policy in the maritime domain.

Port Resiliency Assessment and Planning Tool to Contribute to DOT-funded Research. MSC research PIs from Florida Atlantic University (FAU) have been selected to lead a U.S. Department of Transportation (DOT) funded research institute to address critical issues affecting the planning, design, operation, and safety of the nation's intermodal freight transportation system. The Freight Mobility Research Institute's research efforts will (i) support maintenance and improvement of mobility in the face of growing traffic and shrinking resources; (ii) develop methodologies that link the performance of the U.S. freight transportation system; (iii) increase border-crossing efficiency while maintaining security and resilience; and (iv) improve air quality to advance personal health as well as translate into reduced energy consumption, reduce congestion, and cooperative performance improvement.

In conducting the Institute's research, FAU will utilize the university's Port Resiliency Assessment and Planning Tool, a modeling and simulation tool developed by MSC research PI, Dr. Manhar Dhanar, to quantify the consequences of disruptions at a port and its associated intermodal components. Dr. Evangelos I. Kaisar, Associate Professor and director of the Multimodal Intelligent Transportation Systems Laboratory at FAU will serve as the primary investigator and director for the Freight Mobility Research Institute.

Student Research Project Selected for Acoustical Society of America Lecture Presentation. Students on the Arctic Acoustics summer research team have been selected to present their research in a lecture presentation titled *Experimental Studies of Ice Cracking Tests in an Anechoic Chamber* at the 174th Meeting of the Acoustical Society of America (ASA) in New Orleans, LA, December 4-8, 2017. The team's work will be presented during the technical session on Oceanographic Contributions to the Characteristics and Variability of the Underwater Soundscape.

The student's research assessed the use of underwater acoustic sensors to detect and localize changes in ice cover in the Arctic. The objective of the team's work was to see if acoustic sensors could be utilized to identify potential hazards to vessels from ice floes and breaking ice in the newly emerged Northwest Passage. Over the course of their eight-week summer research project, the students designed and performed more than 120 experiments in the Anechoic Chamber located in Stevens Institute of Technology's Noise and Vibration Control Laboratory and in MSC's Maritime Security Lab, to record and analyze sounds generated by ice fractures. To learn more about the team's research, click here: SRI 2017 - Arctic Acoustics Project.

SRI Arctic Acoustics Team designed and performed more than 120 experiments during their eight-week MSC summer research pr`ogram. The team has been chosen to present their research at the 174th Meeting of the ASA in New Orleans.

The Acoustics project was one of four student research projects conducted during the MSC's 2017 Summer Research Institute (SRI). To review all of the SRI projects, please visit www.stevens.edu/SummerResearchInstitute.

John Martin, MSC Doctoral Fellow, (center) will present his research paper titled Extending Model-based Policy Gradients for Robots in Heteroscedastic Environments at the Conference on Robot Learning.

MSC Doctoral Fellow to Present at Conference on Robot Learning. MSC Mechanical Engineering and Homeland Security Doctoral Fellow, John Martin, has been selected to present his research paper titled *Extending Model-based Policy Gradients for Robots in Heteroscedastic Environments* at the first annual Conference on Robot Learning (CoRL), to be held November 13-15, 2017, in San Francisco, CA. Organized by researchers from Google and UC Berkeley, the conference aims to bring together top researchers in the fields of robotics and machine learning.

Awarded a MSC doctoral fellowship in 2015, John is conducting research into the development of algorithms that enable underwater robots to effectively navigate in the presence of uncertainty. His dissertation advisor is Dr. Brendan Englot, Assistant Professor, Mechanical Engineering and Director, Robust Field Autonomy Laboratory at Stevens Institute of Technology.

John's paper will be published in the Journal of Machine Learning (JMLR) Workshop & Conference Proceedings series.

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