MSC Research Update
February 2019

MSC seeks stakeholder input on student research projects
The Center is seeking input from our stakeholders on student team research projects for its 2019 Summer Research Institute. The STEM-focused program has been engaging undergraduate and graduate-level students in projects tailored to address operational concerns in the maritime and homeland security domain including situational awareness, surveillance and threat detection in underwater and port environments, maritime infrastructure cybersecurity, GPS spoofing and AIS anomaly detection, among other topics. Past projects have resulted in the development of a concept of operations for a UAS deployed sensor equipped buoy system, an underwater passive acoustic recording device and an algorithm for enhanced underwater robot autonomy. This year’s program will take place from June 3 to July 27, 2019. Stakeholder input ensures that our student research projects continue to be relevant and reflect the needs and interests of the maritime and homeland security community. Please contact Beth Austin-DeFares (bdefares@stevens.edu) to share your research project ideas.

Participation Requested: Purdue University is offering webinar demos and collecting user surveys for their MSC project on the Social Media Analytics and Reporting Toolkit, SMART
SMART has been successfully used by many first responder groups across the country for situational awareness or monitoring particular events such as the 2017 Presidential Inauguration, 2018 and 2019 State of The Union Address, and the 2017-2018 Hurricane Seasons. You can see brief videos of the toolkit utility for monitoring Hurricane Sandy and Boston Marathon Bombing. Purdue is interested in conducting surveys on the toolkit to improve SMART’s capabilities to better serve the first responder community. Please see the attached invitation for contact details to request a web demo or participate in the survey.

Director of NJOHSP provides keynote address at MSC co-hosted Technology Foresight Forum
MSC in collaboration with the NPS Center for Homeland Defense and Security (CHDS) NY/NJ Alumni Chapter co-hosted a Technology Foresight Forum on January 17, 2019 at the Stevens Institute of Technology campus. The workshop included panel discussions on the implications of Artificial Intelligence and Machine Learning, and Autonomous Vehicles to homeland security and public policy. Jared Maples, Director of the NJ Office of Homeland Security and Preparedness (NJOHSP) provided the keynote talk and representatives from Uber, NJ State Police, Verisk Analytics and the Center for Data Innovation, among other representatives from public and private organizations participated as panelists. Attendance included representatives from USCG Sector NY, CBP, NJ Office of Homeland Security and Preparedness, NJ State Police, Logistics Management Institute, Port Authority of NY/NJ, FDNY, NYPD, and The Chertoff Group.

MSC@stevens.edu / www.stevens.edu/MSC
MSC prepares work plan for Year 6
MSC has prepared and submitted a work plan including planned and proposed projects for the 2019/2020 fiscal year. The plan includes educational and field-based internship programs for undergraduates and graduate-level STEM students, and tailored professional development short courses for current practitioners, as well as research project proposals in areas of interest to the USCG. The project ideas will be discussed with our USCG stakeholders and will be refined based on their needs. We will also present our research ideas that address the following areas:

- Integrated sensor suite for the detection of illegal fishing
- Integration of sensor suite for the detection of small vessels used in smuggling and human trafficking
- UAS-based vessel inspection
- Anomaly detection from available open-source information, in addition to other related maritime domain awareness projects.

MSC receives project proposals for MSI Summer Research Team program
MSC has received multiple applications from Minority Serving Institution (MSI) faculty seeking to conduct research with the Center through the DHS Summer Research Team Program (MSI SRTP). The purpose of the summer research team program is to enhance the scientific leadership at MSI schools in areas that support the mission and goals of the Department of Homeland Security. MSC has selected two project proposals that will engage the MSI faculty members and their students in research focused on the use of UAS for maritime operations, security and situational awareness, and on the development of a vessel emissions monitoring system. The Center anticipates hosting the teams on-site at Stevens Institute from June through August 2019.

SRI program confirms field-visits to CBP facilities
2019 Summer Research Institute interns will participate in coordinated field visits to two CBP facilities during this coming summer’s program. The field visits will include the Center’s 8th annual trip to CBP field operations at the Port of New York/Newark and an inaugural visit to CBP’s New York Laboratory where the students will learn about the agency’s efforts and practices to forensically analyze potential counterfeit consumer products and pharmaceuticals. Additional plans are being planned for USCG site locations and other DHS national labs and facilities.

MSC to host STEM Educators Workshop focused on the Fundamentals of Sensing Technologies
The Center is coordinating a one-day workshop for high school and higher education STEM educators from MSI and underserved communities to learn and refresh their knowledge of sensing technologies. The workshop will include perspectives from USCG and NOAA personnel on how sensor technologies are used to support the Coast Guard’s operations. Up to sixteen educators will participate in the workshop that will be held on March 22 on the Stevens campus. Participants will receive lesson plan materials and sensor kits that can be utilized in their own classrooms.

MetOcean to provide student team with iSLDMB unit
MetOcean Telematics, a leader in the satellite communications industry are providing a team of students from MSC’s Summer Research Institute with an Iridium Self-locating Datum Marker Buoy (iSLDMB) for their use in developing, testing and evaluating their own design for a UAS deployed sensor equipped buoy system. The team comprised of civil, mechanical, electrical and software engineering students from Stevens Institute of Technology and the University of Hawaii-Manoa communicated with MetOcean throughout their 2018 summer research program and later submitted a project proposal to the organization for support and assistance to develop a prototype of their design. The student led-project is ongoing and will continue to be developed throughout the Center’s 2019 summer research program.