LAKE SUPERIOR STATE UNIVERSITY

April 26, 2021

Dr. Edoardo Sarda, Assistant Professor
School of Engineering
Lake Superior State University
Sault Ste Marie, MI 4973

Dear Dr. Sarda,

On behalf of Lake Superior State University's Center for Freshwater Research and Education (CFRE), I would like to express our strong support for LSSU's application to the RobotX program to acquire a wave adaptive modular vehicle (WAMV) for the next RobotX competition. Located at the nexus of three Great Lakes and nearly 20% of the world's surface freshwater, CFRE is strategically located to play a significant role in Great Lakes research and training. The acquisition of a WAMV would be a tremendous asset to support our mission.

CFRE's facilities are also ideal to support field testing the Free University of Bolzano designs on the vehicle. Our building is located less than 100 m from the St. Marys River so there is access to a major connecting channel in the Great Lakes out our back door, and we have 4 boats and vehicles available to access off-shore sites for field testing. Additionally, our facility possesses an experimental tank lab that can be modified to accommodate large tanks as well as a hatchery that has 6 large raceways (~1.5 m x 8 m) and can also be used for laboratory testing. We have worked with Dr. Sarda and the School of Engineering on current and previous projects, and we fully support their use of these facilities for the RobotX program.

Additionally, we are excited about the acquisition of the WAMV as it will support our research and training initiatives in freshwater science at CFRE. For example, we have ongoing research mapping fisheries habitat and deploying sensor technology on remotely operated vehicles, and the WAMV would allow us to strengthen these research areas. We also would integrate demonstrations of the WAMV into our summer Great Lakes high school camps to engage younger students in technology and science. The WAMV would be a highlight!

This project closely aligns with our goals at CFRE to build partnerships to support research, education, and community engagement in the Great Lakes basin and we are pleased to provide this letter of support and show our willingness to support the success of LSSU's involvement in the RobotX competition. As part of our commitment, CFRE will commit access to our laboratory testing facilities, up to 10 days of boat and vehicle use, and up to $2000 to support student travel to the competition. Thank you for considering LSSU's application.

Sincerely,

Ashley Moerke

Ashley Moerke, Ph.D.
Director, Center for Freshwater Research and Education

Mario Miranda II, Ph.D.c.
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To:

Edorardo Sarda, Ph.D.
Assistant Professor
School of Engineering and Technology
Lake Superior State University
Sault Ste Marie, MI 4973

Dr. Karl von Ellenrieder, Ph.D.
Professor
Facoltà di Scienze e Tecnologie
Libera Università di Bolzano
Piazza Università 5, 39100 Bolzano, BZ Italia

Re: RoboNation Selection Committee, RobotX Maritime Challenge Application

April 30, 2021

It is my pleasure to provide a strong recommendation in support of the collaborative **Lake Superior State University (LSSU) and Free University of Bolzano (UBZ) Proposal for the 2022 RobotX Maritime Challenge**. Being an alumni of Florida Atlantic University, SeaTech – Institute for Ocean and Systems Engineering, I have been extensively taught academically, as well as professionally mentored by Dr. Karl von Ellenrieder, as both an undergraduate and graduate student of the Department of Ocean and Mechanical Engineering. Furthermore, as part of the Office of Naval Research (ONR) Atlantic Center for Innovative Design and Small Ships (ACCeSS) program, I had the honor to have had Dr. Edorardo Sarda as my direct research partner in development of a graduate thesis pertaining to autonomous mobile homing and docking of a WAM-V USV with a Remus 100 UUV. Moreover, Dr. Karl von Ellenrieder served as member on both of our graduate degree committees. In summary of these experiences, I feel proud to advocate that both of these candidates are more than ideal advisors to lead this collaborative team.

My personal experience with ONR/RoboNation collegiate competitions dates back approaching 15 years ago as an undergraduate member of the primarily graduate student driven FAU Roboboat team. For multiple consecutive years I attended these competitions and held multiple positons on the team of which were remarkable experiences that I can assure were a part of the essences to have gotten me to where I am in my professional career today. As an alumni of FAU and a team member of the inagural RobotX competition located in Signapore, I can assure to bring just as much of that feeling of invigoration to future teams, such as the members a part of this proposal, given the opportunity to provide it back.

While currently holding roles at L3Harris Technologies (L3H), as both, L3H National Business Unit Advanced Concept Engineer and also Chief Systems Engineer of an industry critical maritime robotic program for the development of full autonomous manipulation combined with inertial + acoustic and visually aided perception capabilities for highly advanced methods in underwater detection, localization and navigation in intervention applications, there is a plethora of expertise to provide guidance to this student team that I am honored to bring to the table. At L3H Strategic Missions Division (SMD), we specialize in underwater robotics, free-space optical and acoustic systems for sensing/communication/imaging applications, seafloor networks & ocean observatories and highly specialized sensing, command and control (C2) payloads for mobile platforms, both, above and below water. My area of technical expertise resides in underwater acoustic and optical system design, analysis & development, more in specific the system architecture from source to receiver, including the analog + digital data generation & acquisition and signal processing chain. There is a multitude of design, analysis, development & testing techniques that I intend to transfer my knowledge in to this team in effort to not only prepare them for success in a RobotX competitive environment, but also the professional world. I give my fullest of support to Dr. Edorardo Sarda and Dr. Karl von Ellenrieder and they have my complete generosity to aid their students in any capacity that I can be given the opporunity to provide.

Mario Miranda II
Advanced Concept and Chief Systems Engineer
L3Harris Technologies

Travis Moscicki
SMART Scholarship Recipient
Pending Hire
Naval Information Warfare Center Pacific
Recent Graduate
Florida Atlantic University
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Re: RobotX WAM-V Application

April 26, 2021

To the RoboNation Selection Committee,

This letter is written in support of the proposal submitted by Dr. Edoardo Sarda and Dr. Karl von Ellenrieder on behalf of the joint Lake State Superior University (LSSU) and the Free University of Bolzano (UBZ) team. I have worked with this duo, in some capacity, on multiple RobotX Challenges and multiple RoboBoat competitions. Most recently, Dr. von Ellenrieder and Dr. Sarda served as members of my dissertation committee, with the former serving as my dissertation advisor. As I have just recently completed my doctoral degree, and am looking towards starting my professional career at NIWC Pacific, taking on the responsibility of partnering with a RobotX team is not something I take on lightly. However, I do so readily over the opportunity to work with Dr. Sarda, Dr. von Ellenrieder, and the teams that they put together. I intend to add whatever knowledge I have gleaned from my competition career to the vast stores already maintained by this advisory team.

Sincerely,

Travis Moscicki, Ph.D.

LAKE SUPERIOR STATE UNIVERSITY

Paul J. Weber, Ph. D.
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Lake Superior State University
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To:
Edoardo Sarda, Ph.D.
School of Engineering and Technology
Lake Superior State University
Sault Ste Marie, MI 4973

April 29, 2021

Dear Dr. Sarda,

I am writing in support of the **LSSU-UniBz Collaborative Proposal for the 2022 RobotX Maritime Challenge,** on behalf of the School of Engineering & Technology at Lake Superior State University. I have known Dr. Sarda since he was an undergraduate student and have been working closely with him since he joined our School as a faculty member. His research as a graduate student at Florida Atlantic University, his work at KUKA, and his recent advising of several industry-sponsored and internal Senior Projects at LSSU make him an ideal candidate to guide LSSU's part of the team.

Within the School of Engineering & Technology, our students and faculty have access to significant resources, including a multi-million dollar state-of-the-art robotics laboratory; three electronics laboratories; two materials laboratories; and a large machine shop with multiple CNC machines, a variety of 3D printers, welding stations and other manual machineries. Our human resources include electrical and mechanical lab engineers, along with experienced professors in different areas of engineering and engineering technology, including robotics, electrical, mechanical and computer engineering as well as electrical and manufacturing engineering technology. We fully support the use of all the necessary resources currently available within our facilities for the Maritime RobotX Challenge.

Based on my experience as former senior project faculty chair at LSSU, I believe that the challenges involved in the Maritime RobotX Challenge clearly map with the learning outcomes for our senior students. Thus, it will be considered as a potential internal project with devoted students working on it. The Maritime RobotX challenge is aligned with both our School expertise and goals. We have over three decades of experience educating undergraduates in the area of robotics, which has previously included underwater vehicles. This challenge will bolster an already strong multidisciplinary approach to projects, increasing student engagement and sparking interest in STEM-related fields. Thank you for your consideration.

Sincerely,

Paul J. Weber

Chair, LSSU School of Engineering & Technology