

Robotic Sailing 2014

Fearghal Morgan · Dermot Tynan
Editors

Robotic Sailing 2014

Proceedings of the 7th International
Robotic Sailing Conference

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Preface

These proceedings contain the papers presented at the IRSC 2014 (International Robotic Sailing Conference) that has taken place in the National University of Ireland, Galway, in conjunction with the WRSC (World Robotic Sailing Championship) from the 8th until the 12th of September 2014. This is the 7th edition in a series of IRSC proceedings.

Robotic sailing offers the potential of long range and long term autonomous wind propelled, solar or wave-powered carbon neutral devices. Robotic sailing devices could contribute to monitoring of environmental, ecological, meteorological, hydrographic and oceanographic data. These devices can also be used in traffic monitoring, security, assistance and rescue.

The dependency on changing winds and sea conditions presents a considerable challenge for short and long term route and stability planning, collision avoidance and boat control. Building a robust and seaworthy sailing robot presents a truly complex and multi-disciplinary challenge for boat designers, naval architects, electronic and embedded systems engineers and computer scientists. Since 2004, events such as Sailbot, Microtransat, World Robotic Sailing Championship and the International Robotic Sailing Conference have sparked an explosion in the number of groups working on autonomous sailing robots. Despite this interest the longest distance sailed autonomously remains only a few hundred miles. Many of the challenges in building truly autonomous sailing robots still remain unsolved.

The International Robotic Sailing Conference (IRSC) provides researchers with the opportunity to present and exchange ideas on their work on a wide range of topics related to autonomous surface marine robotics (especially sailing robots).

WRSC2014 (organised in conjunction with IRSC2014) includes a series of short distance racing, navigation and autonomy challenges. The competition proposes tasks such as station, speed in different conditions, accuracy, obstacle avoidance, target tracking, endurance and cooperation. The competition, originally designed for sailboats also includes a motorboats category, in order to bring together the scientific communities that work on different types of autonomous marine vehicles.

Previous IRSC/WRSC events have been hosted in France (2013), Wales (2012), Germany (2011), Canada (2010), Portugal (09) and Austria (08).

The proceedings is divided into three sections as follows:

Part I: Sailboat Platforms and Applications

- Design, construction and test sailing of a high-performance SailBot Sea Quester (and a lower cost variant) built using basic tools and inexpensive materials.
- The design and development of a versatile, small, low cost and efficient sailing robot platform (MaxiMOOP).
- The use of a sailboat to tow large objects, with simulated demonstration and practical suggestions.

Part II: Power Management and Mission Planning

- Power management and energy saving strategy for a robotic sailboat.
- An interactive tool (METASail) for assisting the planning, supervision and analysis of missions performed by the autonomous sailboat FASt.

Part III: Controllers and Sensors

- The concept of active course markers relaying environmental conditions to support autonomous sailboats.
- An open source, low cost, Arduino-compatible sailboat controller, incorporating a small and agile real time operating system.
- A piezoelectric sail trim/luffing sensor

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July 2014

Fearghal Morgan
Dermot Tynan

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IRSC2014/WRSC2014 General Chair

Dermot Tynan
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