

Preface

Within living memory, mankind has been taking advantage of wind and water for power generation. Sailing ships and boats have used the wind as propelling force for centuries and contributed crucially to the discovery of new lands and to global trade. Maneuvering a sailing boat from a given starting point to a defined destination under changing wind, weather, and sea conditions is a highly nontrivial task; the skipper needs to adapt to changing parameters and optimize the boat's course during the entire journey. Moreover, sailors often have to sail through narrow passages or within areas with obstacles and dense traffic, simultaneously being aware of and following collision preventing regulations.

While a human being masters many of these complicated steering- and regulation problems through experience and intuition, it turns out to be a challenging task for an autonomous, unmanned sailing device. To maneuver a sailboat safely through changing wind and sea conditions without any remote control or human assistance is a complex and multidisciplinary mission, which involves boat designers, naval architects, electrical engineers, and computer scientists. Many of the challenges in building a truly autonomous sailboat are still unsolved and have stimulated a variety of groups all over the world. Intensive research and development is done within platform optimization, route and stability planning, collision avoidance, power management, and boat control.

Reliable autonomous robotic sailing devices have a huge potential and can be used for a broad variety of practical applications. Self-powered sailing devices are perfectly suitable for monitoring or collecting oceanographic, environmental, meteorological, or hydrographic data. Robotic sailboats can even contribute to traffic monitoring, boarder surveillance and security, assistance and rescue, harbor safety, and carbon neutral transportation.

These proceedings present the cutting edge developments within a broad field related to robotic sailing. The contributions were presented during the 8th International Robotic Sailing Conference organized by Åland University of Applied Sciences and took place in Mariehamn, Finland. In conjunction with the IRSC the World Robotic Sailing Championship 2015 (WRSC 2015) was held. The WRSC 2015 consists of a series of short-distance races, navigation, and autonomy

challenges. The competition proposes tasks such as station keeping, speed in different conditions, accuracy, area scanning, and data collection.

The IRSC/WRSC 2015 is the 8th edition of the event. Previous IRSC/WRSC events have taken place in Ireland (2014), France (2013), Wales (2012), Germany (2011), Canada (2010), Portugal (2009), and Austria (2008).

The proceedings are divided into three parts. The first part is devoted to different hardware solutions for autonomous sailing platforms, including design, construction, test sailing, and applications of different devices. The following part presents ideas related to mission planning, localization, and obstacle avoidance. The third part is dedicated to the design, modeling, and evaluation of sensors and controllers. The allocation of the papers to the different parts might seem somewhat arbitrary, since some of the papers treat several of the above-mentioned aspects. These papers were placed in the category where they seemed to fit best.

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