

Preface

These proceedings contain the papers presented at TAROS 2016, the 17th edition of the conference Towards Autonomous Robotic Systems, held in Sheffield, UK from the 28th to the 30th June 2016. The conference was held earlier in the year than previously, to coincide with the inaugural UK Robotics Week (25th June–1st July). TAROS 2016 included an academic conference, industry talks, robot demonstrations, and other satellite events organized by the University of Sheffield and Sheffield Hallam University, under the umbrella of Sheffield Robotics.

The TAROS series was initiated by Ulrich Nehmzow in Manchester in 1997 under the name TIMR (Towards Intelligent Mobile Robots). In 1999, Chris Melhuish and Ulrich formed the conference Steering Committee, which was joined by Mark Witkowski in 2003 when the conference adopted its current name. The Steering Committee has provided a continuity of vision and purpose to the conference over the years as it has been hosted by robotics centres throughout the UK. Under their stewardship, TAROS has become the UK's premier annual conference on autonomous robotics, while also attracting an increasing international audience. Sadly, Ulrich died in 2010, but his contribution is commemorated in the form of the "Ulrich Nehmzow Best Student Paper Award" sponsored by his family.

TAROS was originally intended as a forum enabling PhD students to have their first conference experience. While the conference has become larger and now attracts a wide range of papers from both senior and junior scientists, TAROS 2016 has kept to the ethos of providing an event that encourages new researchers. The IET sponsored a public lecture, presented by Prof Angelo Cangelosi entitled "Developmental Robotics for Embodied Language Learning".

For the 2016 edition, TAROS received 56 submissions. Two categories of papers were offered, full-length paper, of which 42 submissions were received, and short papers, of which we received 14 submissions. All the papers were reviewed by at least three members of our international Program Committee. Of the full-length paper submissions, 23 were accepted as full-length papers, corresponding to an acceptance rate of 41 %. Also included in this volume are 15 short papers, selected from the remaining 32 submissions, to be presented as posters and demonstrations. The publication of the collected papers from 2016 by Springer, in the *Lecture Notes in Artificial Intelligence* (LNAI) series, testifies to the high standard of the research reported here.

In conjunction with TAROS, Sheffield Robotics and the EPSRC UK-RAS network hosted an agricultural field robotics hackathon challenge at the Sheffield Robotics outdoor robotics proving ground in the Peak District National Park. The competition reflected an agricultural scenario, played out on real-world, challenging terrain. Teams developed software to control, as well as collect and process data from, air and ground robots. Tasks included high- and low-level surveying by fixed- and rotary-wing unmanned aerial systems, and ground-based sampling and intervention by wheeled rovers.

At TAROS 2011, the University of Sheffield and Sheffield Hallam University launched their city-wide initiative for robotics research—The Sheffield Centre for Robotics—which has evolved into the current Sheffield Robotics. This partnership has grown over the last 5 years to have a significant presence in the UK robotics community.

We take this opportunity to thank the sponsors for this year's conference: the IET Robotics and Mechatronics TPN for providing the Prize for the Most Promising Robot Application; Springer for providing the Best Paper Prize; the EPSRC UK-RAS Network for sponsoring one of the invited speakers, and the University of Sheffield for supporting the conference. In addition, we would like to thank the many people that were involved in making TAROS 2016 possible. On the organisational side this included Ana MacIntosh, Louise Caffrey, Ekaterina Netchitailova, James Law, and Iveta Eimontaite. We would also like to thank the authors who contributed their work and the members of the international Programme Committee, as well as the additional referees, for their detailed and considered reviews.

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Jonathan M. Aitken
Lyuba Alboul
Dana Damian
Tony Prescott
Jacques Penders

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Alboul, L.; Damian, D.; Aitken, J.M. (Eds.)

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