

Preface

This volume contains the papers presented at TAROS 2017, the 18th Towards Autonomous Robotic Systems (TAROS) Conference, held at the University of Surrey, Guildford, UK, during July 19–21, 2017 (<https://www.surrey.ac.uk/taros2017>).

TAROS is the longest running UK-hosted international conference on robotics and autonomous systems (RAS), which is aimed at the presentation and discussion of the latest results and methods in autonomous robotics research and applications. The conference offers a friendly environment for robotics researchers and industry to take stock and plan future progress. It welcomes senior researchers and research students alike, and specifically provides opportunities for research students and young research scientists to present their work to the scientific community.

Being a featured event of the UK Robotics Week 2017, TAROS 2017 was held at the University of Surrey to include an academic conference, industry exhibitions, robot demonstrations, and other satellite events. The program highlights include:

- Keynote lectures, given by world leaders in AI robotics from Google, Chinese Academy of Sciences, and UK Atomic Energy Authority.
- Oral presentations, covering topics of swarm and multi-robotic systems, human–robot interaction, robotic learning and imitation, robot navigation, planning and safety, soft and reconfigurable robots, service and industrial robots.
- Poster presentations, covering topics of humanoid and bio-inspired robots, mobile robots and vehicles, robot design and testing, detection and recognition, learning and adaptive behaviors, human–robot and robot–robot interaction.
- Industrial and academic exhibition stands and live demos.
- IET-sponsored evening lecture on the first European Mars rover given by Airbus.

TAROS also offers several prizes on papers and exhibitions. This year the following papers were nominated by the international Program Committee (IPC):

Nominees for Best Paper Prize sponsored by Springer

- Junshen Chen, Marc Glover, Chenguang Yang, Chunxu Li and Zhijun Li, “Development of an Immersive Interface for Robot Teleoperation”
- Jens Lundell, Murtaza Hazara and Ville Kyrki, “Generalizing Movement Primitives to New Situations”
- Ali Narenji Sheshkalani, Ramtin Khosravi and Mayssam Mohammadi, “Verification of Visibility-Based Properties on Multiple Moving Robots”
- Alan Winfield and Marina Jirotko, “The Case for an Ethical Black Box”
- Stefan Schubert, Peer Neubert, and Peter Protzel, “Towards Camera-Based Navigation in 3D Maps by Synthesizing Depth Images”

Nominees for Best Student Paper Prize in memory of Professor Ulrich Nehmzow

- Tom Bridgwater, Alan Winfield, and Tony Pipe, “Reactive Virtual Forces for Heterogeneous Swarm Exploration and Mapping”

- Pedro Proença and Yang Gao, “Probabilistic Combination of Noisy Points and Planes for RGB-D Odometry”
- James O’Keeffe, Danesh Tarapore, Alan Millard, and Jon Timmis, “Towards Fault Diagnosis in Swarm Robotic Systems via Characterization of Robot Behavior”

Nominees for Best Poster Prize sponsored by the UK-RAS Network

- Erwin Lopez, Guido Herrmann, and Ute Leonards, “Drivers’ Manoeuvre Classification for Safe HRI”
- Josie Hughes and Fumiya Iida, “3D Printed Sensorized Soft Robotic Manipulator Design”

The IPC’s Award Panel evaluate the presentations given by the shortlisted candidates during the conference and announced the winners at the Award Ceremony.

The TAROS 2017 Organizing Committee would like to thank all the authors, IPC members, and the conference sponsors including Airbus Defence and Space, Chinese Academy of Sciences, IET, Springer, and the UK-RAS Network.

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