PROCEEDINGS OF SPIE

Unmanned Systems Technology XVIII

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Editors

20–21 April 2016
Baltimore, Maryland, United States

Sponsored and Published by
SPIE

Volume 9837

Proceedings of SPIE 0277-786X, V. 9837

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Unmanned Systems Technology XVIII, edited by Robert E. Karlsen, Douglas W. Gage,
Charles M. Shoemaker, Grant R. Gerhart, Proc. of SPIE Vol. 9837, 983701
© 2016 SPIE · CCC code: 0277-786X/16/$18 · doi: 10.1117/12.2245780

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

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Please use the following format to cite material from these proceedings:
Author(s), "Title of Paper," in *Unmanned Systems Technology XVIII*, edited by Robert E. Karlsen, Douglas W. Gage, Charles M. Shoemaker, Grant R. Gerhart, Proceedings of SPIE Vol. 9837 (SPIE, Bellingham, WA, 2016) Six-digit Article CID Number.

ISSN: 0277-786X
ISSN: 1996-756X (electronic)
ISBN: 9781510600782

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

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Introduction

The Unmanned Systems Technology XVIII conference consisted of six official sessions (and two unofficial joint sessions) that spanned a full two days and covered a variety of areas within robotics. The conference list of papers shows a wide breadth of applications for unmanned systems, primarily in the defense arena, which are predicted to increase in future years. This year's conference also shows that, while there is still interest in the standard unmanned technologies, there is also great interest in other forms of robotics, such as micro air vehicles, which have become very ubiquitous in terms of commercial availability and capability.

This year the conference kicked off with a pair of (unofficial) joint sessions with Conference 9836, Micro- and Nanotechnology Sensors, Systems, and Applications VIII, consisting of work performed under the Army Research Laboratory's (ARL) Micro-Autonomous Systems and Technology (MAST) Collaborative Technology Alliance (CTA). The first session focused on vision-based techniques for navigation of micro air vehicles, including the sensing to support perching and grasping behaviors and attempts to achieve high speed operation. The second session looked at the important issue of combining human feedback with the control algorithms of autonomous vehicles, including research involving trust in autonomy and the use of eye-tracking and EEG data.

Wednesday afternoon began with a pair of joint sessions with Conference 9849, Open Architecture/Open Business Model Net-Centric Systems and Defense Transformation 2016. The first session was on Self-organizing Collaborative Unmanned ISR Teams, where we heard about efforts in creating open architectures for air and underwater vehicles. The second session was Navigation for Unmanned Vehicles and included papers about measuring the angular orientation of a projectile using a polarized RF source, optimal search patterns for underwater vehicles, trust-based control of convoy vehicles, a game theory approach to mobility, and ant-based coordination.

The poster session took place on Wednesday night and had an energy theme, with papers on energy efficient architectures, solar collector for energy harvesting, and battery energy management, as well papers on a fast data transfer protocol, and PD controllers and electric motors for quadrotors. The session was well attended, and there were many pockets of discussion around the posters.

Thursday morning commenced with the special topics session that resulted in the usual potpourri of papers, including an on-board system for recognizing poor driving behavior, energy consumption minimization for network intrusion

detection, human-robot interaction with smart glasses, energy-efficient bipedal locomotion, and a high-power optical link for energy transfer.

The Thursday late morning session was on perception and involved a mix of techniques, including stereo range sensing using LWIR, foliage discrimination using LIDAR, and landmark detection for bio-inspired GPS-denied navigation.

The conference concluded with the afternoon sessions on Thursday, which were devoted to ARL's Robotics CTA, where papers were presented on a variety of subjects, including bipedal walking and gait control for a quadruped, a discussion of simulation environments for robotics, an intuitive interface for path planning, and on detecting social cues in regards to human robot interactions. Additional areas included gesture and speech recognition, vision-based learning for semantic labeling, polarization detection to help with specular reflections in stereo imaging, and deep learning for activity recognition.

This year's conference once again covered a variety of unmanned systems technologies and demonstrated why robotics is such an interesting and exciting area to work in. We want to thank all those that helped make the conference a success this year, and we hope that you enjoy these proceedings and are able to attend and participate in the conference next year in Pasadena, California.

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