Computer Vision and Image Understanding

Special Issue on

Assistive Computer Vision and Robotics

Scope

Assistive technologies provide a set of advanced tools that can improve the quality of life not only for disabled, patients and elderly but also for healthy people struggling with everyday actions. After a period of slow but steady scientific progress, this scientific area seems to be mature for new research and application breakthroughs. The rapid progress in the development of integrated micro-mechatronic and computer vision tools has boosted this process.

In addition, the interest in this research field has further recently increased due to the affordable fallouts of the technologies and methodologies involved in both traditional challenging related problems (such as monitoring of car drivers, behaviors analysis in surveillance contexts, etc.) and pioneering topics (such as customer behavior analysis, innovative sales strategies, etc.). However, many problems remain open especially as regards to environment perception and interaction of these technological tools with people.

The goal of the this special issue is then to focus on research related to assistive technology in which Computer Vision and Robotics take a key role. In particular, the special issue aims to bridge the gap between researchers in computer vision, robotics, machine learning, neuroscience, psychology, rehabilitation science, social science and bio-medical science by providing insight on how to exploits computer vision and robotics in the context of assistive technologies. Research papers involving both academia and industry in novel innovative explorative contributions in the context of assistive computer vision and robotics technologies are encouraged.

List of topics

We invite authors to contribute with high quality paper that will stimulate the research community on the use computer vision and robotics methods to be applied in real-life environments for assistive technologies.

Research papers are solicited in, but not limited to, the following TOPICS:

- Augmented and Alternative Communication
- Human - Robot Interaction
- Mobility Aids
- Rehabilitation Aids
- Home Healthcare
- Technology for Cognition
- Automatic Emotional Hearing and Understanding
- Activity Monitoring Systems
- Manipulation Aids
- Smart Environments and Monitoring Systems
- Safety and Security
- Quality of Life Technologies
- Navigation Systems

- Sensory Substitution
- Mobile and Wearable Systems
- Applications for the Visually Impaired
- Applications for the Ageing Society
- Applications to improve health and wellbeing of children and elderly
- Datasets and Evaluation Procedures
- Personalized Monitoring
- Scene Understanding
- Life-logging
- Food Recognition, Analysis and Monitoring
- Video summarization
- Visual Attention and Visual Saliency
- Egocentric and First-Person Vision

Submissions and Revisions

Submissions to the special issue must include new, unpublished, original research. Papers must be original and have not been published or submitted elsewhere. All papers must be written in English. The submissions will be blind reviewed by at least three reviewers.

Papers should be submitted electronically using the Elsevier CVIU submission system (http://ees.elsevier.com/cviu) and following the Instructions for Authors (http://www.elsevier.com/journal-authors/home). Please make sure that authors select **"SI: Assistive CV and Robotics"** as the Article Type to ensure be correctly assigned. Sent an email to the Lead Guest Editor for any doubt on the submission process.

All submissions will undergo initial screening by the Guest Editors for fit to the theme of the Special Issue and prospects for successfully negotiating the review process.

Submission Schedule

Submission Deadline: March 15, 2015
First Review: May 15, 2015
Revisions Due: July 15, 2015
Final Decision: September 15, 2015
Publication: October 15, 2015

Lead Guest editor details

Name: **Giovanni Maria Farinella**
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Short CV:
Giovanni Maria Farinella is a Research Associate at the Department of Mathematics and Computer Science, University of Catania, Italy since December 2008. He is also associate member of the Computer Vision and Robotics Research Group at the University of Cambridge, United Kingdom since October 2006. He received the (egregia cum laude) Master of Science degree in Computer Science from the University of Catania in April 2004. He was awarded the Ph.D. in Computer Science from the University of Catania in October 2008. From 2008 he is a Contract Professor of Computer Science at the University of Catania. He is also an Adjunct Professor at the Accademia di Belle Arti di Catania (Catania School of Art) in the field of Computer Vision for Artists and Designers (Since 2004). From 2007 he is a research member of the Joint Laboratory STMicroelectronics – University of Catania, Italy. His research interests lie in the field of Computer Vision, Pattern Recognition and Machine Learning, and related application domains. Since 2005 he has been scientifically involved in different public and private research projects. He is author of one book (monograph), editor of 5 international volumes, editor of 2 international journals, co-author of 63 papers in international book chapters, international journals and international conference proceedings, and co-author of 19 papers in national book chapters, national journals and national conference proceedings. He is co-inventor of 6 patents involving industrial partner (STMicroelectronics). Dr. Farinella serves as a reviewer and on the board programme committee for major international journals (IEEE: TIFS, TIP, TMI, TMM, TCSVT – ELSEVIER: PR, PRL, CVIU, SPIC, CBM – EURASIP: JIVP – SPIE: JEI – IET: CV, EL – SPRINGER: JMIV, MTA, PAA – OXFORD: BIOINFORMATICS, CJ – MDPI: SENSORS) and international conferences (CVPR, ECCV, BMVC, IJCAI, ACM MM, ICIP, ICPR, IWCV, CBMS). He has been Video Proceedings Chair for the International Conferences ECCV 2012 and ACM MM 2013. He is General Chair of the International Workshop on Assistive Computer Vision and Robotics (ACVR), to be held in conjunction with the European Conference on Computer Vision (ECCV) 2014. He has been Invited Speaker at international events (The Analysis of Pattern 2009, Invited by Prof. N. Cristianini – Workshop on Applications of Pattern Analysis 2010, Invited by Prof. N. Cristianini – Pattern Recognition and Computer Vision Colloquium 2014, Invited by Prof. J. Matas – School of Functional Genomics 2008, Invited by Prof. G. Nicosia), as well as invited

lecturer at industrial institutions (e.g., STMicroelectronics, Telecom). Giovanni Maria Farinella founded (in 2006) and currently directs the International Computer Vision Summer School (ICVSS). He also founded (in 2014) and currently directs the Medical Imaging Summer School (MISS). Dr. Farinella is an IEEE/CVF/IAPR/GIRPR/AIxIA/BMVA member.

Guest editors details

Name: **Takeo Kanade**
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Short CV:
Takeo Kanade is the U. A. and Helen Whitaker University Professor of Computer Science and Robotics. He received his Doctoral degree in Electrical Engineering from Kyoto University, Japan, in 1974. After holding a faculty position in the Department of Information Science, Kyoto University, he joined Carnegie Mellon University in 1980. He was the Director of the Robotics Institute from 1992 to 2001, and a founding Director of Quality of Life Technology Research Center from 2006 to 2012. In Japan, he founded the Digital Human Research Center in Tokyo and served as the founding director from 2001 to 2010.Dr. Kanade works in multiple areas of robotics: computer vision, multi-media, manipulators, autonomous mobile robots, medical robotics and sensors. He has written more than 400 technical papers and reports in these areas, and holds more than 20 patents. He was the former and founding editor of International Journal of Computer Vision. Dr. Kanade has been elected to the National Academy of Engineering, and also to the American Academy of Arts and Sciences. He is a Fellow of the IEEE, a Fellow of the ACM, a Founding Fellow of American Association of Artificial Intelligence (AAAI). The awards he received include the Franklin Institute Bower Prize, Okawa Award, C&C Award, ACM/AAAI Allen Newell Award, Joseph Engelberger Award, IEEE Robotics and Automation Society Pioneer Award, and IEEE PAMI-TC Azriel Rosenfeld Lifetime Accomplishment Award.

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Short CV:
Marco Leo received the Master Degree in Computer Engineering from the University of Lecce in 2001. Since then he is a researcher at the National Research Council of Italy. His main research interests are in the fields of Image and Signal Processing, Computer Vision, Robotics and Pattern Recognition. He participated in a number of national and international research projects facing automatic video surveillance of indoor and outdoor environments, assistive devices for healthcare and rehabilitation, human attention monitoring, real-time event detection in sport contexts and nondestructive inspection of aircraft components. He serves as reviewer for different international journals and he serves as program committee member for several international conferences. He is co-author of more than 100 papers in international journals and conference proceedings. He is also a co-author of three international patents on visual systems for event detection in sport contexts.

Name: **Gérard Medioni**
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Short CV:
Gérard Medioni received the Diplôme d'Ingenieur from ENST, Paris in 1977, a M.S. and Ph.D. from the University of Southern California in 1980 and 1983 respectively. He has been at USC since then, and is currently Professor of

Computer Science and Electrical Engineering, co-director of the Institute for Robotics and Intelligent Systems (IRIS), and co-director of the USC Games Institute. He served as Chairman of the Computer Science Department from 2001 to 2007. Professor Medioni has made significant contributions to the field of computer vision. His research covers a broad spectrum of the field, such as edge detection, stereo and motion analysis, shape inference and description, and system integration. He has published 4 books, over 75 journal papers and 200 conference articles, and is the recipient of 14 international patents. Prof. Medioni is on the advisory board of the IEEE Transactions on PAMI Journal, and of the Image and Vision Computing Journal, associate editor of the International Journal of Computer Vision, associate editor of the Pattern Recognition and Image Analysis Journal, and associate editor of the International Journal of Image and Video Processing. Prof. Medioni served at program co-chair of the 1991 IEEE CVPR Conference in Hawaii, of the 1995 IEEE Symposium on Computer Vision in Miami, general co-chair of the1997 IEEE CVPR Conference in Puerto Rico, conference co-chair of the 1998 ICPR Conference in Australia, general co-chair of the 2001 IEEE CVPR Conference in Kauai, general co-chair of the 2007 IEEE CVPR Conference in Minneapolis, general co-chair of the 2009 IEEE CVPR Conference in Miami, program co-chair of the 2009 IEEE WACV Conference in Snowbird, Utah, general co-chair of the 2011 IEEE WACV Conference in Kona, Hawaii, general co-chair of the 2013 IEEE CVPR in Portland, general co-chair of the 2015 WACV Conference in Waikoloa, Hawaii, general co-chair of the 2017 IEEE ICCV Conference in Venice, Italy. He is a Fellow of IAPR, a Fellow of the IEEE, and a Fellow of AAAI.

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Short CV:
Mohan Trivedi received his PhD in Electrical Engineering from Utah State University in 1979, after completing undergraduate work in India. He has published extensively and has edited over a dozen volumes including books, special issues, video presentations, and conference proceedings. Trivedi is a recipient of the Pioneer Award and the Meritorious Service Award from the IEEE Computer Society; and the Distinguished Alumnus Award from Utah State University. He is a Fellow of the International Society for Optical Engineering (SPIE). He is a founding member of the Executive Committee of the UC System-wide Digital Media Innovation Program (DiMI). Trivedi is also Editor-in-Chief of Machine Vision & Applications.