



# IAARC NEWSLETTER

International Association for Automation and Robotics in Construction

Newsletter 2012

## A Word from the President



**Moon-Young Cho**  
IAARC President

### In this issue:

Word from the President	1
2012 ISARC Program	2
2012 ISARC Latest Update	3
Book on Robotics	4
IAARC Academy	5
Latest IAARC Flyer	6
Recent Research	7
ISARC 2011 Statistics	8
About IAARC	9

Dear IAARC Members, Friends, and Colleagues,

The 2011 ISARC in Seoul, Korea, had gathered over 400 participants from more than 25 countries. A large number of presentations, posters, and social events contributed to its success.

Now, save the dates and visit our 2012 ISARC in Eindhoven in June!

As Europe is celebrating the “Year for Active Aging 2012” the next ISARC symposium will take place with the world conference of the International Society for Gerontechnology (ISG).

I would like to invite you to register for the 29th International Symposium on Automation and Robotics in Construction (ISARC). The 29th ISARC symposium will be held at the Technische Universiteit Eindhoven, the Netherlands from June 26-29, 2012.

Under the theme “Who is afraid of aging?” all aspects of an aging society will be included, such as quality of life (including leisure and pleasure), home care, life-long working, retrofitting existing buildings and infrastructures, and any of the associated new technologies, such as in the field of



automation and robotics, information processing, remote sensing technologies.

During the three conference days there will be keynotes, leading edge technology events, symposia, chaired oral sessions as well as exhibitions and virtual site visits.

As our 2012 ISARC is approaching rapidly, we invite you to participate actively in sessions of the oral and poster presentations and by exchanging up-to-date knowledge with other participants.

I hope you enjoy the symposium and I look forward to seeing you. soon

For more information, please visit the ISARC website at

<http://www.isarc2011.org>

Dr. Moon-Young Cho  
President IAARC





# ISARC 2012 Highlights and Program

**Register for ISARC 2012 at**  
<http://www.futuresiteconferences.nl/index.php/isg-isarc/>

**Welcome Reception and Conference Registration**  
 Tuesday, June 26, 2012, 7 - 9 P.M.

**IAARC BOD 1st Meeting**  
 Tuesday, June 26, 2012, 4 - 6 P.M.

**Opening Ceremony**  
 Wednesday, June 27, 8:45 - 9:15 A.M.

**IAARC BOD 2nd Meeting and Dinner**  
 Wednesday, June 27, 2012, 6 - 10 .M.

**Banquet**  
 Thursday, June 28, 7:45 - 10 P.M.

**Program overview**

Tuesday, June 26, 2012										
18:00	Conference registration									
16:30 MEETINGS (TU/e campus)	ISG Board			ISG-Chapter: Students			IAARC 1 <sup>st</sup> Meeting of the Board of Directors			
17:30 MEETING (TU/e campus)	Gerontechnology Editors Meeting			ISG-Chapter: Students			IAARC 1 <sup>st</sup> Meeting of the Board of Directors			
18:00	End of meetings on TU/e campus									
Wednesday, June 27, 2012 - TU/e campus										
19:00	Conference registration									
9:00	Opening of the Conference									
9:15 KEYNOTE	Ageing, health and technology in the developed and developing world - C.M. Dye									
9:45 KEYNOTE	Financing and economy of technology for an ageing society - C.N. Teulings									
10:15 KEYNOTES	Demographic change and AAL (Ambient Assisted Living) in the European research area - C. Wehmarm			European Innovation Partnership (EIP) on active and healthy ageing: A new stakeholder approach - M. Iglesias Gomez			Break			
10:45	Break									
11:15 Oral presentation on LEADING-EDGE technologies	At the construction site	BIM (Building Information)	Health engineering for housing	Robotic assistance at home 1	Mobility support	Qualifying rounds 1 & 2 of the 'Sweet Dining Design Contest' - J.H. Sandee	3 Gerontechno-Platform			
Thursday, June 28, 2012 - TU/e campus										
8:30	Conference registration									
9:00	General introduction & best leading-edge technology poster award of yesterday									
9:15 KEYNOTE	Presidential symposium: Scientific basics of gerontechnology - Alain Franco, (convener)									
9:45 KEYNOTE	Telecare adoption and technology acceptance - D.G. Bouwhus, A.M. Sponselee, L.M.J. Meesters			Memory functioning and supportive technology - N. Charness, R. Best, D. Souders			Smart health and wellbeing for an aging population - M. Pavel			
10:15 KEYNOTE	Longitudinal studies on aging and cohort effects: Conceptual and empirical exploration of the synergies with gerontechnology - J.L. Fozard, H.W. Wahl									
10:45	Break									
11:15 Oral presentation on LEADING-EDGE technologies / symposia	Awareness - Acceptance - Adoption 3	Design of housing services	Robotic assistance at work	Automation discussions	Robotic assistance at home 2	Data analysis	Finals 'Sweet Dining Design Contest' - J.H. Sandee (Director)	The role of construction industry and built environment in an aging society - A. Zari, B. Charat (convener) ECTP-ENCORD symposium	An overview of frailty and new technologies - A. Benetos (Convener) IAGG symposium	3 Gerontechno-Platform presentations
11:45 CHAILED ORAL SESSIONS	Awareness - Acceptance - Adoption 3	Design of housing services	Robotic assistance at work	Automation discussions	Robotic assistance at home 2	Data analysis	Finals 'Sweet Dining Design Contest' - J.H. Sandee (Director)	The role of construction industry and built environment in an aging society - A. Zari, B. Charat (convener) ECTP-ENCORD symposium	An overview of frailty and new technologies - A. Benetos (Convener) IAGG symposium	3 Gerontechno-Platform presentations
12:15	Lunch									
12:45 CHAILED ORAL SESSIONS	Awareness - Acceptance - Adoption 3	Alzheimer's disease wandering behaviour: Gerontechnology and ethics - G. Cornet (Convener)	The incubation of gerontechnology - J.A.M. Graafmans (Convener)	Culture and social impact to gerontechnology in the Singapore world - Y.L. Hsu (Convener)	Performance engineering for built environments - G.J. Maas (Convener)	Technologies for older people: Lessons learned from European projects - A. Sisamith (Convener)	Incorporating new technologies in health care systems - J. Lemberger (Convener)	Gerontechnology matrices as collaboration tools - A. Tinker (Convener)	Implementation of technology in elderly care - L. De Witte (Convener) NVG symposium	3 Gerontechno-Platform presentations
13:15 SYMPOSIA	Awareness - Acceptance - Adoption 3	Alzheimer's disease wandering behaviour: Gerontechnology and ethics - G. Cornet (Convener)	The incubation of gerontechnology - J.A.M. Graafmans (Convener)	Culture and social impact to gerontechnology in the Singapore world - Y.L. Hsu (Convener)	Performance engineering for built environments - G.J. Maas (Convener)	Technologies for older people: Lessons learned from European projects - A. Sisamith (Convener)	Incorporating new technologies in health care systems - J. Lemberger (Convener)	Gerontechnology matrices as collaboration tools - A. Tinker (Convener)	Implementation of technology in elderly care - L. De Witte (Convener) NVG symposium	3 Gerontechno-Platform presentations
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17:30 MEETINGS	Registration									
18:00 MEETINGS	General introductions									
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19:00 MEETINGS	Registration									
19:30 MEETINGS	General introductions									
19:45	Banquet with Ig Nobel prize									
Friday, June 29, 2012 - TU/e campus										
8:30	Registration									
9:00 KEYNOTE	Robots at home - T. Arar									
9:30 KEYNOTES	Integration at the nexus of aging, technology, and disability - E.M. Zelinski			Data acquisition, monitoring and control for hybrid solar air-conditioners - O. Ha			Break			
10:00	Break									
10:15 SYMPOSIA	Cognitive training panel - N. Charness (Convener)	Health related research and education at Eindhoven University of Technology - R. Farville (Convener)	Role of cohort effects and technology generations in gerontechnology: Conceptual and empirical - J. Lemberger (Convener)	Finding user-needs to realize Active Aging in the built environment - F.J.M. van Gassel (Convener)	Technological research of assistive technology for older adults - M. Y. Schakof (Convener)	Evaluating the added value of ICT for innovation in care - Y. Schakof (Convener)	A socially assistive robot for persons with COPD - M. Sisonov (Convener)	All student presentations (PhD candidates only)	Empowerment for wellbeing @ TU/e - C.C.M. Hummelis (Convener)	
10:45	Break									
11:15 Virtual visit to AAL Summit 2012	Market and policy development for an aging society conference: New avenues to fill the gap between health and welfare demands and effective ICT solutions (AAL summit 2012) - M. Biddle, O. Rivera, J. Pérez Gil (Summit chairs)									
11:45	Break									
12:00	Overview: Introduction to the next conferences (ISG2014, ISARC2013), Conference closure									
12:30	End of conference with a last refreshment									

Complete ISARC program available at:

<http://www.futuresiteconferences.nl/index.php/isg-isarc/ISGISARC2012/schedConf/program>

## Update for ISG\*ISARC 2012 Conference

Dear IAARC members,

Due to the tireless efforts of Prof. Dr. Annelies van Bronswijk and Prof.ir. Ger Maas, in the past months we are well underway to host the opening of the conference in June 2012.



Very interesting content has been developed and at this moment about 400 abstracts have been received for keynotes, symposia, leading edge and oral presentations.

The quality of the abstracts has delivered a splendid opportunity to design an excellent conference program. This program will show an extensive overview of Automation in Construction and Gerontechnology.

The many contributions will give us all an excellent opportunity to showcase current re-

The organizing committee likes to remind you to register soon. Due to the very large flower and world agricultural exhibition Floriade 2012 there is limited hotel capacity available and hotels do not allow us to extend our room reservation.



So be aware of registration as well as for the conference and for your hotel soon. The organizing committee is proud to welcome you to Eindhoven in June! Please, find all the information that you need on our website: [www.isg-isarc2012.org](http://www.isg-isarc2012.org)

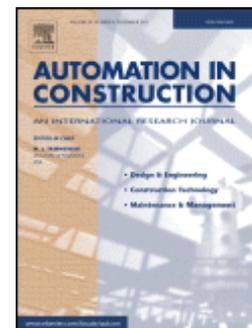
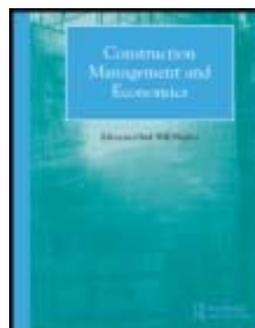
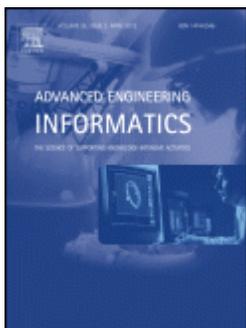
Thank you very much for your interest in the conference.

Frans van Gassel  
General Secretary IAARC

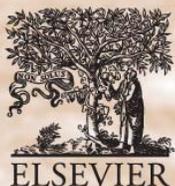


### **Contribute to this newsletter: Read your article here!**

It's free and does not take much time. Please submit your contribution to the next IAARC Newsletter to Dr. Jochen Teizer, Editor of the ISARC Newsletter, E-Mail: [teizer@gatech.edu](mailto:teizer@gatech.edu).



**Submit your research articles to peer-reviewed academic journals !**



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## Book about the Future of Robotics Released Now!

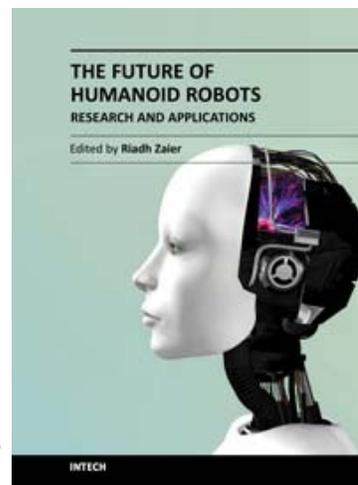
T. Bock, T. Linner and W. Ikeda

*Technische Universität München,*

*Germany*

The Chair for Building Realization and Robotics has written one of the main chapters of the book „The Future of Humanoid Robots - Research and Applications.“

This book provides state of the art scientific and engineering research findings and developments in the field of humanoid robotics and its applications. It is expected that humanoids will change the way we interact with machines, and will have the ability to blend perfectly into an environment already designed for humans. The book contains chapters that aim to discover the future abilities of humanoid robots by presenting a variety of integrated research in various scientific and engineering fields, such as locomotion, perception, adaptive behavior, human-robot interaction, neuroscience and machine learning. The book is designed to be accessible and practical, with an emphasis on useful information to those working in the fields of robotics, cognitive science, artificial intelligence, computational methods and other fields of science directly or indirectly related to the development and usage of future humanoid robots. The editor of the book has extensive R&D experience, patents, and publications in the area of humanoid robotics, and his experience is reflected in editing the content of the book.

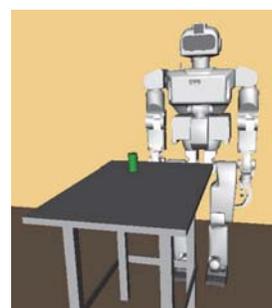


The Chair has contributed to the book with the chapter "Exoskeleton and Humanoid Robotic Technology in Construction and Built Environment." The book is published by InTech Open. A digital version of the book and the individual chapters are available for free download.

Download whole book: <http://www.intechopen.com/books/show/title/the-future-of-humanoid-robots-research-and-applications>

Download the chapter Exoskeleton and Humanoid Robotic Technology in Construction and Built Environment: <http://www.intechopen.com/articles/show/title/exoskeleton-and-humanoid-robotic-technology-in-construction-and-built-environment>

The Future of Humanoid Robots - Research and Applications  
ISBN 978-953-307-951-6, Publisher: InTech, January 2012





## International Association for Automation and Robotics in Construction

**IAARC is the only global organisation dedicated to the advancement of Automation and Robotics in Construction.**

### IAARC's objectives:

- To encourage, facilitate and promote the coordination of scientific and technical development in Automation and Robotics in Construction (ARC)
- To facilitate the collection, compilation, publication, exchange and dissemination of scientific ARC data and information.
- To encourage the execution of fundamental ARC studies, to advance research, laboratory investigations and field tests and to accelerate the use of ARC.
- To assist the end-user application of Automation and Robotics in the construction industry.



**Meeting of the Board of Directors 2010**

### Through:

- Organising ISARC-events
- Participation in ISARC's
- Active membership in community committees
- Website [www.iaarc.org](http://www.iaarc.org)
- Newsletter



**Tucker-Hasegawa Award 2009 for Carl Haas**



**Moon-Young Cho new IAARC president**

### Members from:

Spain, Sweden, Japan, USA, Republic of Korea, Poland, Canada, The Netherlands, Germany, Israel, Finland, India, Taiwan, Australia, Italy, Slovenia, Lithuania, Luxembourg, Kuwait, United Kingdom, Saudi Arabia, Egypt, China, Switzerland, Ecuador, Slovakia



**Bratislava Slovakia ISARC 2010**

### Member benefits are:

- Participation in a network of world class construction technology innovators
- Participation in a community of scholars, researchers and industrialists
- Opportunities to meet and interact with fellow members
- Exchange of state of the art knowledge and ideas
- Benchmarks for research progress and quality
- Opportunities to initiate international research projects
- Opportunities to coach young people in an international environment
- Opportunities to publish in IAARC's international journal, AUTCON (Elsevier)
- Participation in the annual meetings (ISARC conferences)
- Active membership in community committees
- Influence on IAARC's objectives and its future direction
- Web links from the IAARC site to your own web site
- Discounts for IAARC-supported activities such as ISARC conferences
- Exhibition rights at the annual ISARC conferences

### Coming ISARC's

2012: The Netherlands [www.isg-isarc2012.org](http://www.isg-isarc2012.org)

2013: Canada

### Membership:

For 2010 the personal membership is free, except BOD members. For a membership form see website.



**AUTCON is encouraged by IAARC**



**Publication by IAARC**

**Corporation members:** Royal BAM Group, Swedish Construction Federation, National Institute of Standards and Technology NIST USA, Hyundai Engineering & Construction Group Korea, Hangil IT Korea

Cooperation with



# Recent Research Articles in the Automation and Robotics Research Domain

The following summaries are provided by

*Hiam Koury, American University of Beirut, Lebanon*

## Development of space database for automated building design review systems

*J.-K. Lee et al., 2012*

This paper presents the design and implementation of space database for developing automated building design review systems. We have developed a set of four software modules for reviewing different aspects of a specific building type — US Courthouses. IFC (Industry Foundation Classes) provides the common building model schema from which these analyses are carried out. Space objects, like other BIM-building objects, can carry their information-rich space objects and space use semantics internally to the model; we have used instead external space database to an easily supported information base. We describe the problem of space database, how space objects can be automatically organized and classified within BIM systems based on their space database, and our reflection on best practices learned from application development. All the research and development features noted in this paper are implemented in a software plug-in module that constitutes a subset of other pre-processing operations and design review systems.

## Part based model and spatial-temporal reasoning to recognize hydraulic excavators in construction images and videos

*Azar and McCabe, 2012*

Detection of earthmoving equipment in construction images and videos can increase the automation level of many construction management tasks such as productivity measurement, locating of machines, work-zone safety, and semantic image and video indexing. Some of the earthmoving plants, such as hydraulic excavator, have articulated shapes making them a difficult target for even state of the art object recognition algorithms. The goal of this paper is to develop a model for non-rigid equipment detection and pose estimation in construction images and videos. In this paper, we describe an object recognition system based on mixture of appearances of deformable body parts of the hydraulic excavator and compare its results with general Histogram of Oriented Gradient detectors in both images and videos. Then a spatial-temporal reasoning model is presented which uses time and space constraints of the excavators' moving patterns to improve the detection results in videos.



## New Courses Offered at the IAARC Academy

Beginning in October 2011, the IAARC Academy will offer its new courses focusing on automation and robotics in construction and building technologies for professionals of the construction and building industry, architects, civil engineers, mechanical engineers, electrical engineers, computer scientists, managers and health professionals.

### These courses may benefit if:

- You work as an onsite construction or precast concrete factory manager
- You want to modernize your construction company
- You want to develop new market niches
- You are interested in the development and application of frontier engineering and emerging technologies

### What you will learn:

These courses will show you how to rationalize and modernize your construction factories, your onsite processes and adjust existing buildings to new customer needs such as caused by demographic change.

The design philosophy will show you how to design for rationalization by automation and robotics, how to design the concepts in these courses are suitable for continuous customization and, therefore, are capable of providing solutions for the rapidly changing needs in the market. You can increase your competitiveness not only by improving efficiency, but by also developing new market opportunities.



### IAARC courses:

- AIR—Ambient Innovation Robotics
- iCAR—Industrialized Customization in Architecture
- L/SAR—Logistics/Site Automation & Robotics
- SSR—Service Science & Robotics
- DCD—Demographic Change Design
- ROD—Robot Oriented Design
- iP1—Integrated Project 1
- IDS—Innovation Deployment Strategies
- iP2—Integrated Project 2
- Inc—Incubator

For more information, visit the  
IAARC Academy website:

<http://www.iaarc-academy.com>



ISARC 2011 was successfully held with all the members' support and contribution in Seoul, Korea during June 29 ~ July 2, 2011. The total number of presented papers was 298(226 oral presentations and 72 poster presentations) from 27 different countries including (Australia, Bangladesh, Brazil, Canada, China, Czech Republic, Egypt, Finland, Germany, Hong Kong, India, Iran, Israel, Italy, Japan, Korea, New Zealand, Poland, Scotland, Slovakia, Spain, Sweden, Taiwan, Thailand, The Netherlands, United Kingdom, USA) and 442 people attended the symposium. The below figures show the percentage of the number of the papers in the proceeding and visitors of the symposium.



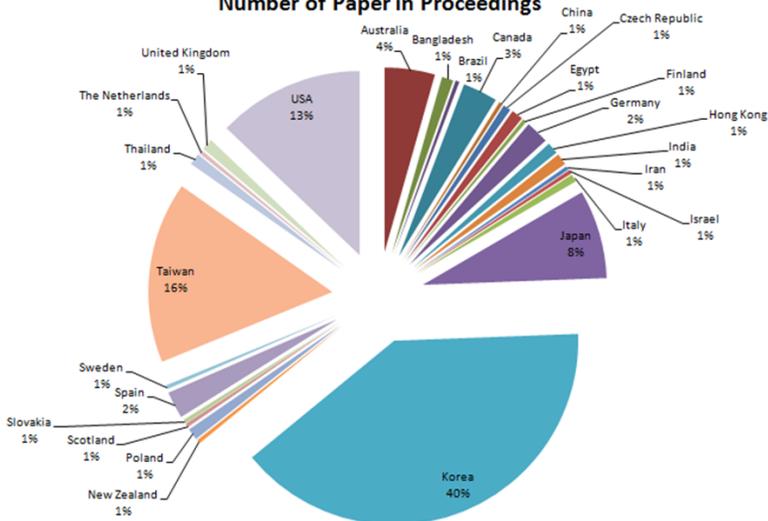
The 3 keynotes sessions were presented by Prof. Ger Maas & Frans Van Gassel (Robotizing Workforce In Future Built Environments), Tatsuo Arai (Advanced Robotics & Mechatronics And Their Applications In Construction Automation), and Chang-soo Han ("Human-Robot Cooperation Technology" An Ideal Midway Solution Heading Toward The Future Of Robotics And Automation In Construction). Moreover, 34 sessions were presented in all the field of Automation and Robotics in Construction. The titles is as follows; Advanced Computing in Construction, Architecture and Planning, Augmented and Virtual Reality, Automation and Robotics in Building Construction, Automation and Robotics in Civil Engineering, Automation in Maintenance and Inspection, Building Information Modeling, Collaborative Design and Construction, Computational Mechanics, Computer-aided Construction and Management, Computer-aided Design, Computer-aided Education and Training, Computing for Conceptual Design, Decision Support Systems, Disaster Preparedness, Response and Recovery, Energy Efficiency, Field Robotics, Geographic Information Systems, Management Issues in Construction, Project Information Management, Sensing Technology for Construction and Maintenance, Service Robotics, Space and Extreme Engineering Application.

ISARC is not only an academic research symposium, but also the intermediate for the industry. Numerous companies from the various countries actively participated during the ISARC 2011 including HanGil IT Co., Ltd., Building-facade Maintenance Robot Research Center, The research group of Intelligent Excavating System, Haneol Solution, Liftec Co., Ltd. Sensorway, Consortium for Robot Based Construction Automation System for High-rise Building, ALDEBARAN Robotics, GS E & C and 5Dwith.

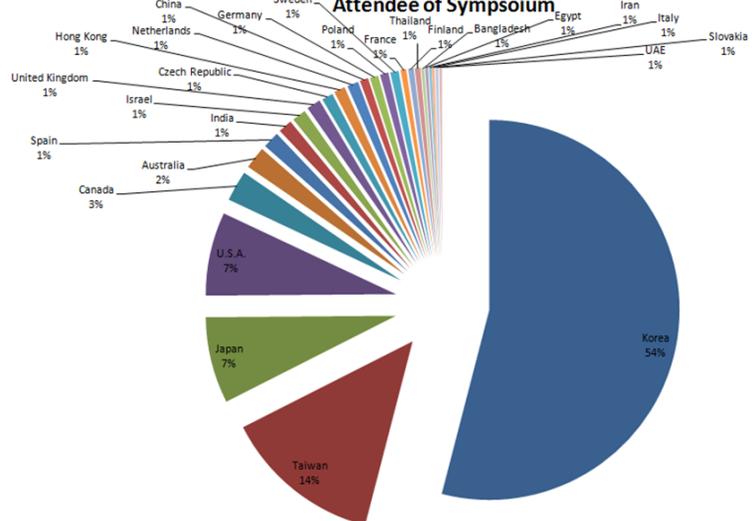


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**Number of Paper in Proceedings**



**Attendee of Symposium**





## About IAARC and Contact Information

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- To encourage the execution of fundamental ARC studies, to advance research, laboratory investigations and field tests and to accelerate the use of ARC.
- To assist the end-user application of automation and robotics in the construction industry.

### IAARC Contact Information:



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IAARC website:

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