



IAARC NEWSLETTER

International Association for Automation and Robotics in Construction

Newsletter 2016



Carl T. Haas
IAARC President

A Word from the IAARC President

Dear IAARC Members, Friends, and Colleagues,

The annual newsletter of the International Association for Automation and Robotics in Construction (IAARC) covers some of the most recent events and achievements of our IAARC community.

It also provides you with the latest information to the 34th International Symposium on Automation and Robotics in Construction (ISARC) which will be held in Taipei, Taiwan from June 27-30, 2017.

Within the past 15 months we saw two successful ISARCs in Oulu, Finland (2015) and Auburn, USA (2016). Each symposium had over 130 peer-reviewed papers and presentations. Due to an increased interest of the construction industry in information technology and automated solutions the number of attendees at ISARCs has steadily grown over the past years. This newsletter covers some stories of the most recent ISARC and gives a glimpse on what we can expect from the ISARC 2017.

To ensure a better service for all of our IAARC members (academia and industry), the IAARC Board of Directors (BOD) has decided to modify its existing organization. It has established a number of vice-presidents that are responsible for specific IAARC domains. More details of the committees the vice-presidents direct can be found on page 6.

Other general news are covered in this newsletter that might gain the interest of academics and practitioners. See pages X to X for that information.

I am very thankful to Prof. Koshy Varghese from the Indian Institute of Technology (IIT) Madras for having served as the IAARC president from 2013 to 2016. Without his work an increase in the IAARC membership and the forming of a new IAARC organizational structure would not have been possible.

More information on how you can join IAARC or participate at one of our future ISARCs can be found on pages 11 to 13.

Prof. Carl T. Haas
President of IAARC

Call for papers
ISARC 2017

<http://www.isarc2017.org>

In this issue:

Word from the President 1

Review of ISARC 2016 2

Upcoming ISARCs 4

UK Robotics Challenge 5

3D Printing @ IIT Madras 6

New IAARC Organization 7

Springer: New Journal 8

Obituary Prof. Hasegawa 8

ISARC Award Winners 2015 9

Contact Information 13



Review of ISARC 2016

*Text provided by Prof. Anoop Sattineni, Auburn University, Conference Chair, ISARC 2016
Photos by Jochen Teizer and Frédéric Bosché*

The **33rd International Symposium for Automation and Robotics in Construction at Auburn University** was a great success. This year we **had more than** 130 presentations from researchers in over 30 countries. We had very good attendance from well over 200 faculty, research colleagues, and students from around the globe showcasing their research in the construction field.

The theme for the symposium this year was **‘Collaboration Between Academia and Industry’**. Therefore the symposium organizers invited several industry-affiliated representatives for keynote presentations. As part of the event they showcased their research on innovative technologies and how it solves practical problems in the construction industry. An opportunity was provided for them to learn from academic research and perhaps even influence the academic researchers in their efforts to solve realistic construction problems. It also allowed academic researchers to learn about how the industry uses technology.

A further highlight in IAARC’s history was the hosting of the **first ISARC technical workshop** on the topics related to “Computer Vision Algorithms and Tools for Construction Automation and Robotics”. Prof. Feng and Kamat did an outstanding job that will guide future technical workshops at ISARCs.

The ISARC 2016 concluded with a gala dinner at the **University of Auburn’s Alumni Center** which again provided the opportunities for social contacts and listening to a very thoughtful keynote presentation by an historian.



Thank you Anoop, Amanda, and Carl!

Anoop

Amanda

Carl

Review of ISARC 2016 @ Auburn University

Auburn, located in Alabama, was a perfect place to experience a large rural campus with nearly 30,000 students. Auburn University owns the 22nd largest sports stadium in the world. The pictures demonstrate that IAARC is a living community of academics and industry practitioners that enjoyed great Southern-style food while working hard on automation and robotics.



Tucker-Hasegawa Award Winner

J. Gašparík, Slovak University of Technology in Bratislava

Best Paper Award Winners



Semi-Autonomous Mobile Robots for Ambient Data Collection in Indoor Building Environments

B. Mantha, C. Menassa and V. Kamat

Target-Free Automatic Registration of Laser Scanned Color Point Clouds

P. Kim, J. Chen and Y.K. Cho

Large Scale 3D Printing of Complex Geometric Shapes in Construction

J. Teizer, A. Blickle, T. King, O. Leitzbach and D. Guenther





Update on ISARC 2017 and 2018

Get ready to attend ISARC 2017

All details to the 34th ISARC to be held in Taipei, Taiwan from June 28 to Jul 1, 2017 can be found at <http://www.isarc2017.org>.



Flyer of ISARC 2017

“Willkommen!” ISARC 2018 will be in Berlin, Germany



Connected Work Site 4.0

The IAARC Board of Directors (BOD) voted in one of its meetings in Auburn, U.S.A. on the location for the 35th ISARC. Two bids were placed and the potential hosts had terrific presentations. The elected winner is Berlin. The team of Jochen Teizer, Markus König, and Timo Hartmann will be the hosting chairs. The event location will be the city campus of the Technical University of Berlin (TU Berlin). The 35th ISARC will take place from **July 23-26, 2018**. More details will follow soon.



Attractions in Berlin

International Robotics Challenge 2017 at University of Leeds

provided by Raul Fuentes

An International Robotics Challenge Event on 27th & 28th June 2017 at University of Leeds, Leeds, UK.

'In the air, on the ground, underground and underwater – robots to create, inspect, repair and maintain the physical infrastructure of our everyday lives'

A two day challenge event to bring academics, industry, policy makers and stakeholders together to explore a future use of robots in the creation, inspection, repair and maintenance of critical infrastructure. Application areas are across broad domains including civil infrastructure, transport (rail, road, sea), offshore energy, space, and nuclear. For more information visit:

<http://selfrepairingcities.com/events/resilient-infrastructure-challenge-launch-08-december/>



ROBOTS FOR RESILIENT INFRASTRUCTURE

An International Robotics Challenge Event
27 and 28 June 2017
University of Leeds, Leeds, UK





3D Printing Conference held in Chennai

provided by Koshy Varghese and Jochen Teizer



Over 150 experts from academia and industry attended a three-day long conference on 3D printing at the Indian Institute of Madras' campus in Chennai in August 2016.

Presenters from all over the world focused on mechanical engineering, structural design, material properties, construction automation and robotics as well as economical feasibility issues to propel the state-of-the-art of construction practices.

While existing research and early experiences in 3D printing were shared, specific focus was set on how and when 3D printing can advance Indian's construction industry.

Prof. Varghese leads an expert panel that guides the next steps of IIT Madras in 3D printing.



80 sq m house in just three days? IITM working on new tech to make it possible

By S V Krishna Chaitanya | Published: 09th August 2016 03:41 AM Last Updated: 09th August 2016 03:41 AM

Tweet Like 37 G+ 0 Email 4



First 3D printed model in Dubai The building uses Chinese company WinSun's tilt-up technology, where the floor, walls and ceiling are all 3D printed. It's the world's first 3D printed building. Ideally, the printer would be located at the job site in Dubai, but in this case it was built in WinSun's factory in China. The modules were cut in half so that they could be shipped more easily and reassembled on site.

CHENNAI: THE IIT-Madras is taking first baby steps in 3D printing of concrete and will be introducing the revolutionary concept to the Indian construction industry by holding a global core group meeting on Tuesday, in which representatives from the United States, China, Germany and France will be participating.

The 3D printing of concrete is seen as the new phenomenon and the next big thing in construction industry that would call all the shorts a few years down the line. It would enable the architects and builders to embark on the most complex construction designs with ease, which have so far been impossible to achieve with conventional construction. Also, the researchers claim 3D printing is substantially quick. How about building 80 square metre houses in 3 days!

The Department of Mechanical Engineering at IIT Madras has already built a prototype of 3D printer for input materials such as polymer and metals and will soon be kick-starting their research in developing an indigenous 3D printer for concrete. Also, IIT-M has a strong team pioneering in concrete materials led by professors like Koshy Varghese and Ravindra Gettu of Department of Civil Engineering.

As a precursor to the global meet, a one-day international workshop was conducted on Monday at the Centre for Industrial Consultancy and Sponsored Research (IC&SR), where global players such as Hong Kong University of Science and Technology; Lafarge Holcim R&D, France; RAPIDS Construction Safety and Technology Laboratory, Stuttgart, Germany; University of California, Berkeley, US; and Technical University Dresden, Germany gave presentations on the progress of the 3D printing of concrete technology, its benefits and limitations.

Surendra P Shah, honorary visiting professor at IITM and professor emeritus at Northwestern University in the US, told Express on sidelines of the workshop that the concept is a game changer, but has a long way to go before actually 3D printing of the building becomes real. "Members of Indian Concrete Institute (ICI), Ready Mixed Concrete Manufacturers Association (RMCMA), L&T and Ultratech will seek clarifications on the technology at the global meet and come out with a position (white) paper," Shah said.

Mixed reactions

Though the Indian construction industry at the outset seems to be excited about new emerging technology, the level of confidence of near future application is not so high. When Express spoke to the bigwigs of the industry, there were mixed reactions.

V Ramachandra, Technical Head, UltraTech Cement Ltd, said it's too early to judge. "Yes, it has potential. Precast concrete, for example, in the last three years has gained lot of attention. But, in India, people see whether the technology has value for money. Even if 3D printing cuts down the time of construction and remains expensive, it will not taste success."

However, B Sivarama Sarma, Head (R&D), L&T Construction, said that with availability of skilled labour being an issue, such technology should be promoted and put to use.

"Imagine, you are designing, choosing material including walls, roofs, floor, pillars etc. for your house. In Germany, there is a mall which sells only the building material. All we have to do is bring them and attach on site. It will be automated. 3D printing will cut the time and should cut the cost when scaled up. However, it will take at least a decade for it to emerge as alternative," he said.

One of the organisers, MR Kalgal, president, Indian Concrete Institute (ICI), said India is the best growing superpower and has biggest construction industry. "We need to adopt the latest technologies to fill the gaps that cause project delays."



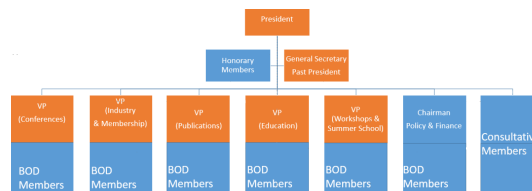
Update to IAARC's Organization

provided by Koshy Varghese, Carl T. Haas and Jozef Gašparík

The IAARC Board of Directors decided in its ISARC 2017 meeting in Auburn to restructure IAARC's organization. The proposal for the organizational restructuring of IAARC was lead by the former IAARC president Koshy Varghese and anonymously approved by the BOD. Based on the discussions and inputs received the BOD meeting took the following key decisions:

The revised organizational structure and general guidelines are as follows:

- The executive committee will consist of the President, General Secretary, Past-President and Vice Presidents.
- Vice-Presidents of Groups are elected by the BOD - if required. Default term for a Vice-President is three years, but can vary based on performance.
- One of the Vice-Presidents will be elected as the next president.
- Each group will be chaired by a Vice-President (except committee (vi) which will be chaired by the president). Under chairmanship of the Vice Presidents, every group will develop annual objectives and a plan of work.
- The executive committee will meet quarterly to review progress on these objectives. The Vice-Presidents will present reports at the annual BOD meetings, to be held during the ISARC.
- A new category of membership "Consultative Members" was formed. Any BOD member who does not attend/contribute actively to ISARC/IAARC will be moved to the consultative category for a period of 3 years. Consultative Members who do not pay membership dues will be reminded of membership dues, otherwise they will be retired from the BOD.
- There is no hard limit on BOD members by country if the membership is justified due to stature, level of commitment.
- Non-performance of BOD members will result in an exit from the BOD. The Vice-Presidents and group members decide upon a performance matrix that is to be developed as a guideline.



- New BOD member structure (**Vice-Presidents** are in bold):

- (i) Conferences: **Hyoung Kwan Kim**, Quang Ha, Rauno Heikillä, Markus König, Jochen Teizer, Nan Li, Jongwon, Min-Yuan Cheng, Daniel Castro
- (ii) Education: **Thomas Bock**, Koshy Varghese, Yong K. Cho, Alexey Bulgakow
- (iii) Workshops & Summer School: **Benny Raphael**, Isaac Shabtai, Alessandro Carbonari, Ioannis Brilakis, Vineet Kamat
- (iv) Industry & Membership: **Jochen Teizer**, Raul Fuentes, Benny Raphael, Xiangyu Wang, Sonwook Kwon, Par Ahman
- (v) Publications: **Frederic Bosche**, Xuesoong Johnson Shen, Markus König, Hung Ming Cheng, Junbok Lee, Daehie Hong, Anoop Sattineni
- (vi) Policy & Finance: **Carl Haas**, Koshy Varghese, Jozef Gašparík, Chang Soo Han, Osama Moselhi, Hiroshie Furuya, Frans van Gassel, Ioannis Brilakis



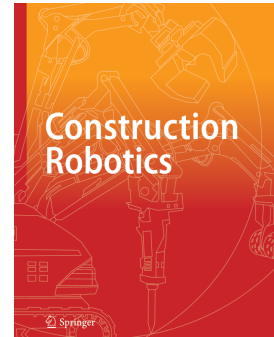
Updates and News

Springer names new journal “Construction Robotics”

by Thomas Bock

This journal serves as a forum for research and discussion in the emerging domain of robotics as applied to construction, civil engineering and architecture. It explores the application of robotics in construction and demolition, linking research in robotics, architecture and civil engineering. The journal presents research and applications in the integration of robotics into construction processes. It covers robotic automation; prefabrication, jobsite assembly and disassembly; inspection to demolition; robotic site mapping; material handling; social, environmental and legislative implications of construction robotics.

Related subjects: Civil Engineering, Mechanical Engineering and Robotics.
Further information: <http://www.springer.com/engineering/robotics/journal/41693>



A Pioneer of Robotics - Obituary Prof. Hasegawa

by Thomas Bock

Prof. Yukio Hasegawa passed away on May 23rd, 2016 at the age of 89. Prof. Hasegawa was a pioneer of construction robotics.

He organized very actively the construction robotics research society in Japan in the late 1970s at JARA. In early 1980s he made great impact with the WASCOR project at Waseda University by automating the construction sector as well as other fields. Having successfully automated the Japanese watch production, the robotization and automation of the construction sector became soon his focus.

He contributed to IAARC from its beginning in the 1980s as well. His name is part of the famous Tucker-Hasegawa Award that IAARC awards annually to person who made great impact to the field of automation and robotics in construction.

I have met Prof. Hasegawa in the late of 1984 at his research institute at Waseda University. His constant support even after my initial visits to Japan scripted my successful career. With gratitude I pay my respect to his passion and lifetime work in Robotics and all the contributions he made to IAARC. My thoughts are with his family.

The photo was taken at the Hasegawa residence in Urawa on 1st of July 2016 during my condolence visit on behalf of IAARC. Together with Prof. Maeda and Dr. Yoshida, Prof. Hasegawa initiated construction robotics in late 1970s. Prof. Arai now heads construction robotics commission in Japan.





CIB W119 Workshop @ TU München

Proceedings and more information to the publications can be found <http://www.iaarc.org>.



Joint CIB - IAARC Commission on "Customized Industrial Construction"



Proceedings of the CIB*IAARC W119 CIC 2015 Workshop

"Advanced Construction and Building Technology for Society"

Editors:

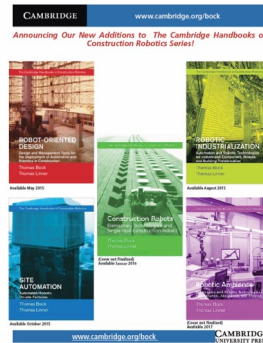
Thomas Bock (Prof. Prof. h. c./SRSTU Dr.-Ing./Univ.Tokio)
 Christos Georgoulas (Dr.-Ing.)
 Thomas Linner (Dr.-Ing.)
 Jörg Güttler (M.Eng.)
 Seongki Lee (M.Arch.)

Sponsors:



28 Oct 2015

Laboratory of Building Realization and Robotics **br**²
 Technische Universität München (TUM), Germany



More IAARC News

Best Paper Award Winners ISARC 2015 in Oulu, Finland

Methods for simulating crane-deployment plans used in construction of nuclear power plants
 Y. Sugimoto, H. Seki, T. Samo, and N. Nakamitsu

Implementation of an open and interoperable process to optimise design and construction phases of a residential building project
 A.L.C. Ciribini, S.M. Ventura, M. Paneroni

A cloud-based system framework for storage and analysis on big data of massive BIMs
 H.-M. Chen, C.-C. Hou, and T.-H. Lin



Profile of Award Winners ISARC 2015

Center for Technology Innovation

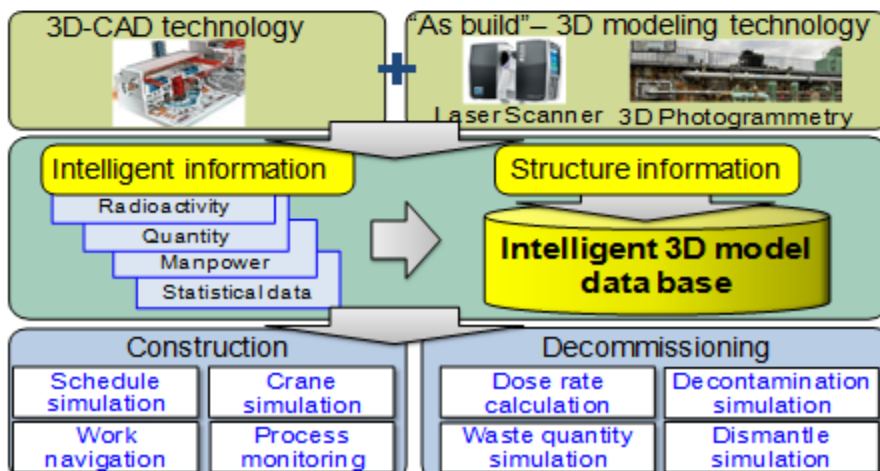


Team Member Yohei Sugimoto, Hiroshi Seki
 Department Center for Technology Innovation - Energy ,
 Research & Development Group, Hitachi, Ltd.
 E-mail yohei.sugimoto.pj@hitachi.com, hiroshi.seki.mf@hitachi.com

The Center for Technology Innovation(CTI) in Research and Development Group of Hitachi develops innovative technologies for various products as in the following figure.



In CTI-Energy, we have been developing IT systems for effective and reliable planning, management, and field work related to construction, maintenance, and decommissioning of nuclear power plants. For this purpose, we have been researching simulation technologies based on an intelligent 3D model which integrates 3D-CAD technologies, sensing data acquired from photogrammetry and laser scanning, and statistical data.





Profile of Award Winners ISARC 2015

University of Brescia, Department of Civil Engineering and Architecture (DICATAM)

BIM Research Group

Prof. Angelo L. C. Ciribini

angelo.ciribini@unibs.it

Tel.: +39 030 3711229

Via Branze, 43 - 25123, Brescia – Italy



Since 2006, the University of Brescia has been involved in BIM-related research projects and has implemented BIM-based education modules about Building Design, Construction Management, and H&S Management. Currently, the BIM Research group of DICATAM, in collaboration with industrial partners, Public Administrations and other Academic Entities, is investigating several BIM themes and conducting a series of pilot projects on the subject of BIM-based Project Management and Field BIM. Specialised on BIM for building projects, the Research Group has recently started to investigate BIM for infrastructure too, from both a methodological and technological point of view.

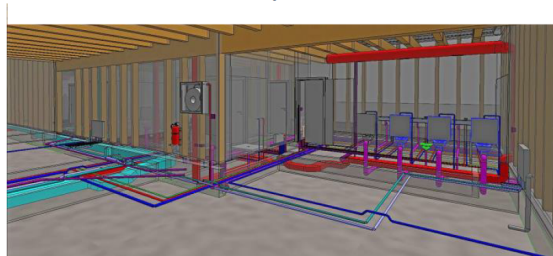
The University of Brescia is one of the academic participants at the Italian Research Programme of National Interest (PRIN) named “Built Heritage Information Modelling/Management - BHIMM”, supported by the Ministry of Education, University and Research. Our Research Unit is involved in work packages related to methods and technologies dealing with the automated surveying, information modelling and 4D & 5D planning-related methodologies of refurbishment and restoration construction sites.

Recently, the BIM Research Group took part at the first Italian BIM experimentation managed on behalf of a Public Administration in order to test the advantages of BIM compared to traditional design and construction management practices in a Public Procurement. An Open BIM approach was adopted in order to improve coordination and collaboration between different design disciplines and to validate the design phase performing advanced Model and Code Checking. Furthermore, the findings obtained from this investigation allowed the Research Group to begin a research programme concerning the e-Public Procurement. Finally, a recent research project about Behavioural Design aims to support the adoption of collaborative, integrated and anticipated practices within design and construction processes since the early stages comprehensive of Space Programming, Digital Briefing and Sketching by means of Model Checking and Data Analytics.

In collaboration with contractors and SMEs, the BIM approach has been used to optimise the design phase thanks to the evaluation of the effective constructability of the project. In some cases, BIM enabled the collaboration between the contractor and the supply chain in order to find the best solutions for a high performance construction site. 4D BIM, BIM-based Constructability Review and BIM-based Construction Site and Safety Planning are some of our main themes. A Serious Game was also created to be used as educational tool for Health and Safety Management on the construction site. Currently, the BIM Research group is working on the Field BIM-based approach to Construction Management and a M.Sc. Educational Workshop is focused upon this topic working on a case study provided by a large, high-reputed, Italian General Contractor. Desktop and mobile BIM tools for construction management are used to emphasise how traditional Planning & Scheduling tools need to be sided by innovative packages based on Visual Thinking.



Serious Game as educational tool for H&S on the construction site



Multi-disciplinary coordination at the construction phase



Profile of Award Winners ISARC 2015

**BIM Research Center, Taiwan Building Technology Center,
National Taiwan University of Science & Technology**

Director: Hung-Ming Chen, Ph.D., Professor
Department of Civil & Construction Engineering

To meet international trend and domestic policy, the BIM Research Center in TBTC at NTUST focuses on intensifying diversified applications of BIM, the cultivation of seeded teachers, the import of domestic and foreign resources, and conducting industry-university cooperative research. The goal is to facilitate skilled personnel foster and international development of BIM, as well as contribute the advance of BIM technology for information integration and application throughout a project life cycle, including planning, design, construction, operation and maintenance, and urban renewal.

BIM + Internet Computing :
Multi-disciplinary design collaboration using a hybrid client-server and P2P network model

This study develops a system to enable Internet-based modeling collaboration among teams from multiple disciplines for the development of a Building Information Model (BIM). The proposed networked system allows geographically separated design teams to work simultaneously on a single multi-disciplinary BIM, using a distributed system to achieve design integration and conflict resolution. A hybrid client-server and P2P network was proposed to enable such modeling collaboration. A BIM generation workflow with various support functions was proposed based on this hybrid network.

Multi-disciplinary Model

BIM + Cloud Service + Life - Cycle Engineering :
Cloud services for aiding operations in project life - cycle based on BIM system model

An Internet-based design platform for interdisciplinary collaboration has achieved the development of a single unified BIM model cooperatively on a central server. Based on extending and processing such single unified BIM model, this study attempts to develop new BIM-based operation models that assist several major operations in project construction and maintenance phases. In addition, Cloud-based framework will be introduced to establish these BIM-based operation models as Cloud services provided in a computing and data center which holds the multidisciplinary model.

BIM + Cloud Computing + Web3D Technology :
A System Platform for BIM Web Services with Integration of Cloud Computing and Web3D Technology

In this study, cloud and Web3D technologies were utilized to develop a BIM data center, which can handle the big data of massive BIMs using multiple servers in a distributed manner, and can be accessed by multiple users to submit and view BIMs online concurrently. WebGL was employed achieve the display of BIMs in 3D on browsers. Apache Hadoop, an open-sourced distributed file system, was adopted to establish the BIM data center. Schema of Bigtables for storing big data of massive BIMs in HBase was proposed. MapReduce distributed computing was employed to process big data of BIMs. Mahout and R were integrated into the system as the data mining tools to analyze the processed data after for find hidden dependencies or regularities for decision support on facilities control.

Client

Server

Presented by HTML5 + WebGL

Providing Data transmission and Web Application

Build a Data Center for BIM Data by HBase and HDFS

BIM + Augmented Reality + Indoor Positioning :
System development and application scenarios of an on-site BIM viewer based on integration of augmented reality and indoor positioning technologies

This study applied integrated indoor positioning and AR technologies to develop an on-site viewing model of BIM. The model first uses indoor positioning to identify the room where user locates, and then uses markers to identify the building elements in the room. Then BIM information is displayed and superimposed on real building elements in 3D component models or surrounding texts using AR technology. A prototype system was developed to achieve the integrated display of virtual BIM and real on-site scenes on a head-mounted display without manual navigation for model viewing. Four application scenarios were proposed to support operations in construction, acceptance, maintenance, and decoration phases of a project.



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 are:

- 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

Some of the IAARC activities are:

- Organising the annual ISARC's
- Participation in the CIB IAARC W199 committee: Customised Industrial Construction
- A website www.iaarc.org (with free access to all ISARC proceedings) and newsletter
- Conducting the IAARC-Academy



Award ceremony



Innovation in Construction

IAARC members are from the following countries:

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



General session during the annual International Symposium on Automation and Robotics in Construction (ISARC)

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

The next ISARC will be in 2015:

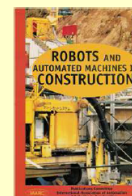
Oulu, Finland: <http://www.ril.fi/en/events/isarc2015/home.html>

Membership:

Please see the IAARC website for more information to the membership: http://www.iaarc.org/pe_membership.htm.



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





Updates and News to IAARC Organization

1984-2016: All ISARC Proceedings Now Online For Free!

Thanks to the efforts of Profs. Carl Haas and Koshy Varghese, the 1986 ISARC proceedings were found in a bookshop in Paris, scanned, and made available on the IAARC website. You can find access to all proceedings here: <http://www.iaarc.org/publications/search.php>



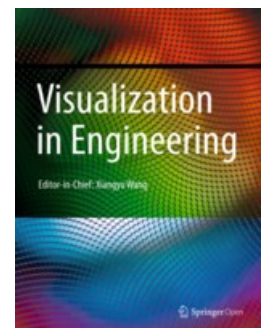
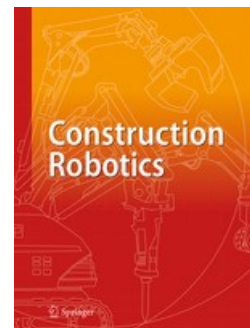
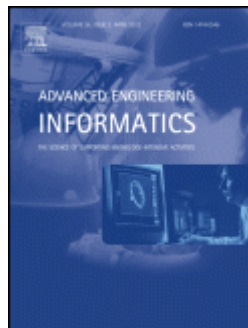
Connect with IAARC via LinkedIn



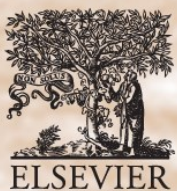
<https://www.linkedin.com/groups/IAARC-International-Association-Automation-Robotics-2794315/about>

Contribute to the Next Newsletter!

Please submit your contribution to the next IAARC Newsletter to Dr. Jochen Teizer or Dr. Frederic Bosche, Editors of the ISARC Newsletter, E-Mail: jochen@teizer.com or f.n.bosche@hw.ac.uk



Submit your research articles to peer-reviewed academic journals !



AUTOMATION IN CONSTRUCTION
AN INTERNATIONAL RESEARCH JOURNAL

To submit an article, go to www.elsevier.com/locate/autcon



About IAARC and Contact Information

IAARC is the only global organization 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.

IAARC contact information:



IAARC President

Carl T. Haas
University of Waterloo
Waterloo, Canada
E-Mail: chaas@civmail.uwaterloo.ca



IAARC President Emeritus

Koshy Varghese
IIT Madras
Chennai, India
E-Mail: koshy@iitm.ac.in



IAARC General Secretary

Jozef Gasparik
Slovak University of Technology in Bratislava
Faculty of Civil Engineering
Radlinského 11, 813 68 Bratislava, SK-Slovakia
Website: <http://www.iaarc.org>
E-mail: secretariat@iaarc.org or jozef.gasparik@stuba.sk



IAARC Vice-President for Media & Publications

Frédéric Bosché, f.n.bosche@hw.ac.uk

IAARC Vice-President for Industry & Membership

Jochen Teizer, jochen@teizer.com

For more information,
please visit the
IAARC website:

<http://www.iaarc.org>