



IAARC Newsletter

International Association for Automation and Robotics in Construction

Newsletter 2011



Moon-Young Cho
IAARC President

A Word from the President

I would like to invite you to attend the 28th International Symposium on Automation and Robotics in Construction (ISARC). I am proud to announce that ISARC will be held in Seoul, Korea, my home country. The Symposium will take place at the Imperial Palace Hotel from June 29 to July 2, 2011.

The annual ISARC symposium has been held since 1984 and boasts more than 200 attendees from all over the world. The symposium is a gathering of world renowned researchers, academics and industrial practitioners in automation and robots in construction. Specific topics of the symposium include the construction industry, civil and building engineering design and project execution, advanced construction machinery and robotic applications in construction, information technologies for planning, design, logistics, computer-aided project

management, environmental protection issues, building systems monitoring and control, safety and recovery operations, and temporary/rapid construction technologies. This event has been largely successful thanks to the enthusiasm of the participants and their contributions.

I hope you enjoy the symposium and I look forward to seeing you. For more information, please visit the ISARC website at <http://www.isarc2011.org>.

Dr. Moon-Young Cho

ISARC 2011
The 28th International Symposium on
Automation and Robotics in Construction

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ISARC 2011

The 28th International Symposium on
Automation and Robotics in Construction



June 29 - July 2, 2011
Imperial Palace Hotel, Seoul, Korea

Register for ISARC 2011 at
<http://www.isarc2011.org>

Highlights and Program

Welcome Reception with Drinks and Light Dinner
Wednesday, June 29, 6:30 to 10 P.M.

Opening Ceremony
Thursday, June 30, 9 to 9:20 A.M.

Banquet with Korean Performance
Friday, July 1, 2011, 6 P.M. to 10 P.M.

Technical Tour
Saturday, July 2, 2011, 9 A.M. to 4 P.M.

	Jun. 29 (Wed)	Jun. 30 (Thu)	Jul. 1 (Fri)	Jul. 2 (Sat)
09:00		Opening	Keynote Lecture	Conference Tour
10:00		Keynote Lecture	Keynote Lecture	
11:00		Coffee Break	Coffee Break	
12:00		Concurrent Session	Concurrent Session	
13:00		Lunch	Lunch	
14:00		Poster Presentation	Poster Presentation	
15:00		Concurrent Session	Concurrent Session	
16:00		Coffee Break	Coffee Break	
17:00	Registration	Concurrent Session	Concurrent Session	
18:00			Break	
19:00	Welcome Reception		Banquet	

2011 ISARC Scientific Program

The ISARC 2011 organizing committee invited specialists and scholars in the field of automation and robotics in construction.

In addition, Oral Presentations and Poster Presentations will be held during the Symposium. A scientific program will enable participants and speakers to share their views and opinions through extensive discussions, which will bring further development to the field of automation and robotics in construction.

Keynote Lecturers



Frans J. M. van Gassel

Eindhoven University of Technology

The Netherlands

Robotizing Workforce in Future Built Environments



Ger J. Maas

Royal BAM & Eindhoven University of Technology

The Netherlands

Robotizing Workforce in Future Built Environments



Tatsuo Aria

Osaka University

Japan

Advanced Robotics and Mechatronics and Their Applications



Chang-soo Han

Hanyang University

Korea

Human-robot Cooperation Technology for Automation in Construction



W119 Commission Kick-Off Meeting Friday, July 1, 2011 in Seoul, Korea



Attend the Customized Industrial Construction Commission Kick-Off Meeting

During the conference, CIB members, IAARC members and other attendees are invited to join the Customized Industrial Construction Commission (W119) Kick-Off Meeting on Friday, July 1st from 13:30-15:30.

The commission, a joint activity between CIB and IAARC welcomes researchers, practitioners and government officials who are interested in improving the performance of the construction industry in the area of industrialized, adaptable and affordable housing for our societies.

Future markets will require a just-in-time response in terms of adaptive production systems. Customized industrial construction can achieve this by frontier engineering sciences which generate innovations. These innovations are driven and amplified by globalization, closed loop utilization of resources, transformation of technological potentials as well as environmental and demographic challenges.

The Working Commission "Customized Industrial Construction" will start its first project on "Industrialized adaptable and affordable Housing." It is intending to contribute to the following challenging problems of the construction industry:

- In the developed countries, the wages for workmen are generally high even in the construction sector. Therefore the use of high performance mechanized, automated construction is required to ensure sustainable construction as well as a decrease of costs for investment and for maintenance of housing and infrastructures. In developed countries, the use of industrialized processes in construction aims at homogenizing the quality and decreasing the number of labor hours per unit fabricated.
- In the high growth countries, there is a great need to produce a vast number of affordable, adaptable and sustainable robust housing and infrastructures in a very short period of time due to very rapidly growing populations and vast immigration to cities and mega cities. In high growth countries, industrialized processes in construction aim at employing a large number of workmen. In these countries, industrialized processes in construction aim at ensuring process and product quality, which could up to present not be guaranteed by the employment of a huge number of unskilled labor. Industrialized standardized controlled construction processes and management will improve quality, reduce fault occurrence and increase the output due to higher productivity.

For more information on this event, please visit the [W119 Commission](#) site. You can find more information on the activities of CIB W119 in the [CIB online database](#) "Commissions." In the shown search engine type "W119" in the field "Commission number" and press "Find records."

CIB W119 Coordinators:

Gerhard Girmscheid, girmscheid@ibi.baug.ethz.ch

Thomas Bock, Thomas.bock@br2.ar.tum.de



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>



Robotizing Housing and Design

F.J.M. Van Gassel

Purpose

In the next 20 years the Dutch workforce will decrease from 11 to 10 million persons¹. In the domain of housing construction it calls for two roads of innovation: (i) robotizing of job elements, and (ii) providing the built environment with robot characteristics. Both approaches call for a new view on design and construction. Some best practices already exist: (i) Smoothing concrete floors with a trowel machine, controlled by a construction worker, and (ii) Stairs equipped with small elevators and ceiling cranes in bath rooms, controlled by the end-user. In the future an increase of special equipment or even robotics will taken place in dwellings. William Mitchel, former dean of MIT's School of Architecture and Planning, approaches dwellings as 'robots to live in'². An example of such a dwelling-robot is the WABOT home³. Floors move up and down to increase the mobility of the inhabitants. dean of MIT's School of Architecture and Planning, approaches dwellings as 'robots to live in'². An example of such a dwelling-robot is the WABOT home³. Floors move up and down to increase the mobility of the inhabitants. Although technological support can be made available by current processes of mechanization, robotizing and automation⁴, certain physical, are needed in the process of construction

cognitive and organizational characteristics and renovation that are little taken into account. Technological knowledge exists in the domains of ergonomics, mechatronics and ICT, and imaging systems, but implementation commonly lacks a deep understanding of design and construction processes and daily living scenarios (ADL, iADL).

Method

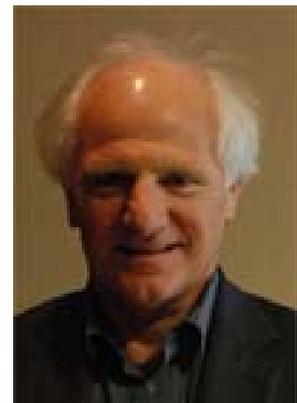
The deep understanding needed, is attempted by collaboration of the stakeholders with future users from the earliest stage of the architectural and construction processes⁵. An important part of this collaboration is a well planned and controlled design meeting with well chosen tools to facilitate the meeting activities. Participation of end-users in such design meetings needs special competences of the design manager to explicate their user values.

Results & Discussion

Successful robotizing of the residential environment is the result of a carefully organized collaborative design process in cooperation with future users, and relevant designers. Contrary to tradition, professional stakeholders need to use new working methods that are based on detailed observations of construction and daily living activities.

References

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2. Mitchel WJ. e-Topia. Cambridge: MIT Press; 2000; p 593
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4. Gassel FJM van, Maas GJ. Mechanising, robotising and automating construction processes. In Balaguer C, Abderrahim M, editors, Robotics and automation in construction. Vienna: In-Tech; 2008
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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.

New Perspective in Industrialization in Construction, A State-of-the-Art Report

Gerhard Girmscheid and Frits Scheublin

Background

Industrialization in Construction is defined as a rationalization of the work processes in the industry to reach cost efficiency, higher productivity and quality.

It involves a change of thinking and practice to improve the production of construction to produce a high quality, customized built environment, through an integrated process, optimizing standardization, organization, cost and value, mechanization and automation.

Several aspects are usually linked with industrialization such as: Use of mechanical power and tools, use of computerized steering systems and tools, production in a continuous process continues improvement of efficiency, standardization of products, pre-fabrication, rationalization, modularization and mass production.

Drivers to industrialize construction include the need for safety, better quality control, better occupational health, better environmental care, cheaper production and the lack of skilled labor. This book is divided in 4 main sections.

- Context
- Strategies
- Methods and Tools
- Products

In the last chapter some successful examples of industrialization are shown. This wide range of internationally recognized personalities from academia and business gives the book a broad focus, which is in line with the industrialization approach.

Context

The context of industrialization shows that industrialization not only creates new opportunities, it also forces the construction industry to adapt new practices. Industrialization enables the construction industry to manage material and energy flows better. Optimized material management stands at the beginning of environmental careful construction. It is a condition for sustainable construction. The most powerful driver behind the second industrial revolution was and still is the emergence of computer technology, while the three-dimensional reproduction technology will facilitate the next big step forward in industrialization.

Strategies

Strategies of industrialization will overcome the constraint between the large series of identical products from industrialized suppliers and the client's aim for individualism. Industrialization therefore requires a cultural change or paradigm shift. The methods and tools already available to help industrialization in the construction sector to take a step forward are numerous. They vary from robotizing of traditional craftwork to completely new techniques especially designed for application in industrialized construction. Industrialization in construction is expected to solve problems inherent to traditional construction such as occupational health issues and waste generation, but it also causes new problems typical of industrialized construction such as a need for standardized measurement methods and the observation of strict tolerances for prefabricated components, produced by a variety of suppliers.

Another constraint to industrialization is the lack of suitable information technology and the reluctance among the labor force to adapt to emerging information technology. Last but not least there are many good examples of contractors with a vision and even some with experience with full industrialized construction systems.

Synthesize

This book synthesizes the worldwide state of the art and state of practice in industrialization in construction. Therefore it targets researchers as well as practitioners. This publication gives a very thorough insight into new innovated concepts on which research is currently focusing as well as into the further development of existing concepts. For practitioners it provides the state of practice. The book contributes to the enhancement of the product of the construction process by providing concepts for value-added individual buildings according to the mass customization approach. It also targets the increasing productivity of construction industry by using the computer supported digital chain to design, produce and maintain these value-added individual buildings. Hence it makes a significant contribution to the future development in research and practice.



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.

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