



## The International Association for Automation and Robotics in Construction

Newsletter 2009 · Issue 1

### A Word from the President:

I would like to invite you to attend the 26<sup>th</sup> International Symposium on Automation & Robotics in Construction (ISARC) which will be in Austin, Texas, U.S., from June 24-27, 2009. We expect more than 100 presentations at ISARC 2009 which will make it, again, a very lively and interesting event.

The annual ISARC symposium has a long history. It all started in 1984 in Carnegie Mellon University, Pittsburgh, Pennsylvania (US) – by some visionaries from the US, Japan & Israel, none could have imagined that there would be a conference on an **annual basis** for a quarter of a century! I have attended most of the conferences since 1989 and believe they are of very high quality. They are so successful thanks to the enthusiasm of the participants and their contributions which are of such high standard.

All ISARCs are organized by the International Association for Automation & Robotics in Construction (IAARC). IAARC is run by a Board of Directors (BOD), which draws IAARC's policies, decides about future ISARCs, maintains the growth of its membership, and controls the quality of the symposia, etc. You will find more details to IAARC and ISARC in this newsletter.



I wish you all a very fruitful & enjoyable symposium & I'm looking forward to seeing you

### Next ISARC Conference:

Automation and Robotics In Construction (ISARC 2009)



Austin, Texas, U.S. June 24-27, 2009

Register here:

<http://www.cae.utexas.edu/isarc2009>

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## News:

- **Tucker-Hasegawa Award to Prof. Dr.-Ing./Univ. Tokio Thomas Bock:**



During the 25th International Symposium on Automation and Robotics (ISARC) held in June 2008 in Vilnius, Lithuania Prof. Dr.-Ing./Univ. Tokio Thomas Bock received the Richard Tucker – Yokio Hasegawa highest honor award. Dr. Ronie Navon, IAARC president, gave him the plaque during the symposium dinner.

Thomas Bock is professor at the Technical University in Munich, Germany. He is the immediate past president of IAARC and has been an internationally renowned leader in construction robotics for over 20 years. He has personally established and led well-known construction robotics laboratories, first at the University of Karlsruhe and subsequently at the technical University of Munich, both are located in Germany.

He is very well known outside of Germany, particularly in Japan and China, for his inspiration and leadership in construction automation and robotics research and development.

- **On-line ISARC 2008 Proceedings CD:** The complete content of the official Proceedings of the 25th International Symposium on Automation and Robotics in Construction (ISARC) CD-ROM is now available online at <http://www.iaarc.org>.

2009 International Symposium on

## **Automation and Robotics In Construction (ISARC 2009)**

### Upcoming Event:

**26th ISARC 2009  
Austin, Texas, U.S.A.  
June 24-27, 2009**

The 2009 International Symposium on Automation and Robotics in Construction (ISARC 2009) will be the 26th symposium. The 26th ISARC will be held in Austin Texas, U.S.A., from June 24 to 27, 2009. The first symposium was held in June 1984 at Carnegie Mellon University in Pittsburgh, Pennsylvania, USA. Later symposia from this series were organized and held in France, Israel, Japan (multiple times), USA (multiple times), United Kingdom (multiple times), Germany (multiple times), Poland (multiple times), Spain, Taiwan, The Netherlands, South Korea, Italy, India, and Lithuania.

The annual ISARC symposia are sponsored by the membership of the International Association of Automation and Robotics in Construction (IAARC). They are a prestigious gathering of researchers, academics and industry practitioners in all specialties related to the construction industry, including civil and building engineering/design and project execution, advanced construction machinery and robotics 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.

### **Website:**

<http://www.cae.utexas.edu/isarc2009>

## On-going research towards automation of loading in a front loader or similar machine

Ahmad Hemami

Automation of loading implies that a cyclic excavator, such as a front-end-loader or a Load-Haul-Dump unit, loads itself automatically and without the continuous interaction of an operator. Two important issues to mention are: that the excavator must move forward during operation in order to complete its task and that it has a relatively flexible structure. This latter leads to the deformation of the structure of the machine during loading, which results in an unsuccessful operation if the forces acting on the bucket are not appropriate at each instant of time. The results, when available, can be extended for automation of other types of excavators.

Various researchers have worked on this topic, but because of the complexity of the problem as well as some other reasons the support from industry has been limited and the research on this subject has had a slow pace in the past years. The main issue is defining a feedback control policy based on which the bucket motion may be determined. Despite the fact that a number of control schemes have been proposed, none has been implemented to a real machine or proved to work successfully.

Because of the high cost of conducting experimental research the current work of this author focuses on the development of a computer program in which the behaviour of the bulk media is emulated. This software can be employed to examine and evaluate the effect of the control policies that have been proposed by researchers. The work on this software is partly completed showing the result of forcing a bucket into media. This is the force that must be regulated by the feedback law. The current work in progress is on the implementation of each proposed control law.

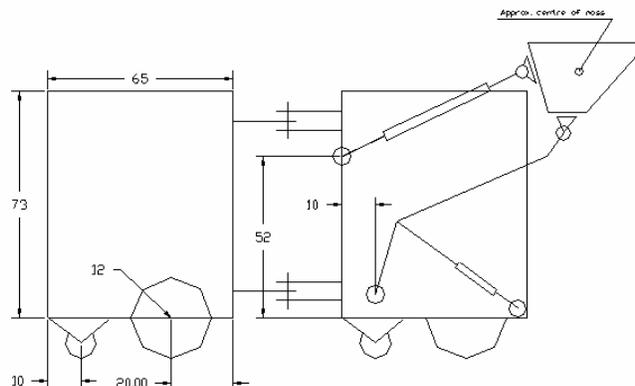


Figure 1. A laboratory model of a Load-Haul-Dump unit (Used in underground mining)

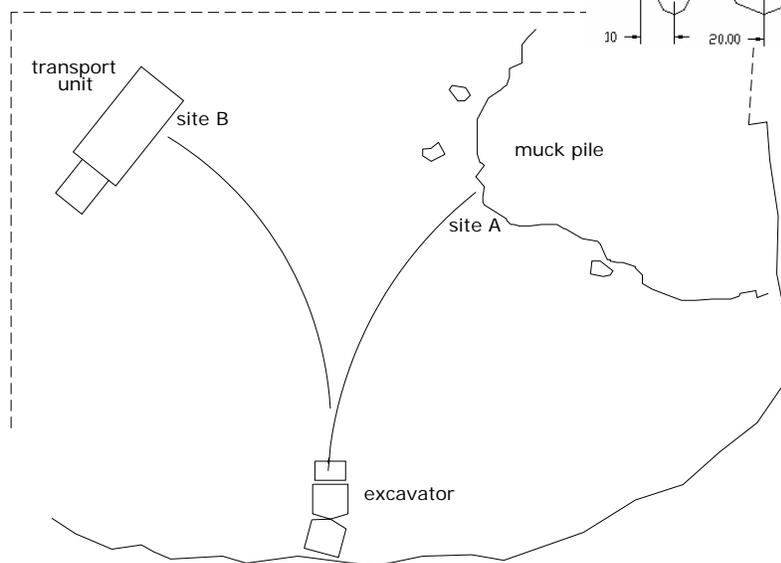


Figure 2. A simple scenario for application of automated loading

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## New Course on Home Robotics and Home Automation in Eindhoven

*Frans van Gassel*

Spring 2009 will see a new course on 'Robotics and home automation' that is meant for (post) master students.

Educational aims include the introduction in:

- Real needs and wishes of end-users;
- Available and expected automation and robotic technologies;
- Consequences for the architectural design and building process.

The course will contain lectures, workshops and the writing of papers.

Aging of society calls for a different outlook on the functionalities needed for life long housing, including aging-in-place. Modern ICT should be able to supply the required functionalities, but the roll out of dedicated robotics and home automation lags behind. The course will start with the aspirations, needs and capabilities of the humans involved, followed by the functionalities technology has to offer, and the required ICT and

organizational infrastructure. Success and failure will be demonstrated with real residential projects.

The course has been set up and will be given by prof. dr. Annelies van Bronswijk (chair Public health engineering for built environment) and ir. Frans van Gassel (researcher in construction robot applications) in addition to guest lecturers. The language is English. The content of the course will be chosen in collaboration with the International Society for Gerontechnology (ISG) and the International Association for Automation and Robotics in Construction (IAARC).

The course is part of 'Construction Governance' of the master programs 'Architecture, Building and Planning' and 'Building Services' and will be facilitated by the recently erected group 'Performance Engineering of Built Environments' (PBE) by prof. dr. Annelies van Bronswijk (chair: Public health engineering for built environments) en prof. ir. Ger Maas (chair: Construction engineering and management) at TU/e, Eindhoven.



*The WABOT-HOUSE laboratory in Japan is a symbiotic society where robots and human beings share the same sphere of living embraced by the natural environment. The detail shows a floor adaptable system.*



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## Intelligent Decision Support System for Mega Construction Projects

*Hyoungkwan Kim*

A noteworthy research effort is being conducted in Korea to develop an integrated decision support system for mega construction projects. Led by professor Chang-Taek Hyun at the University of Seoul, a research consortium was formed in December 2007, in order to improve the performance of mega construction projects, particularly in the area of urban regeneration. In Korea, the market for urban regeneration projects has rapidly grown and the government started to see the importance of effective management of those construction projects. Ministry of Land, Transport, and Maritime Affairs finally decided to fund the research consortium with a total of approximately US\$ 10 million for the next 6 years.

The program concept which is larger than just the aggregation of many projects is being used to accurately identify the dynamic and complex nature of mega urban regeneration projects. As can be seen from many examples all around the world, the program concept is essential to carefully coordinating and deploying the available resources for the success of mega construction projects. The research consortium's main focus lies in the

following four parts: spatial planning, process development, cost/time management, and performance management as shown in the figure below. These areas, with the help advanced information technologies, will be integrated into the final product of intelligent program management system.

This research effort is already obtaining lots of attention from the vibrant Korean construction industry. A special emphasis is placed on the rapid transfer of the new technology to the industry. This is why, from the very early phase of the research, mega project test beds were selected to verify any new tools that will be developed soon. The final decision support system and other research results are expected to significantly improve the performances of mega urban regeneration construction projects.

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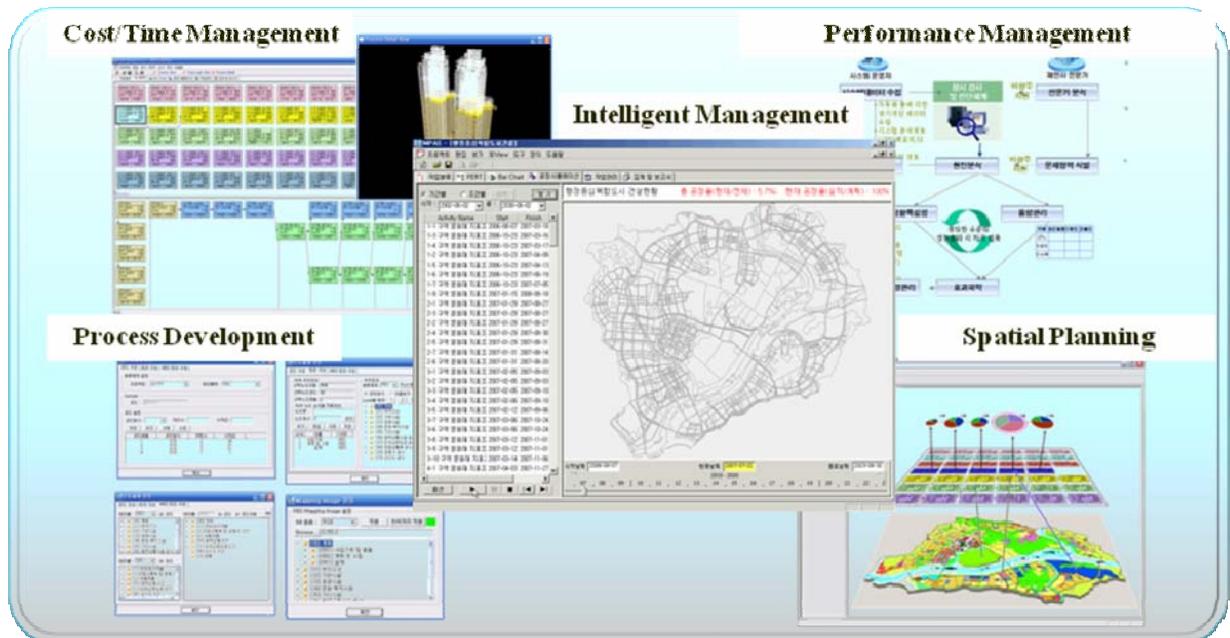
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*Intelligent Decision Support System*  
*for Mega Construction Projects*



**Here can be your article!**

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

**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.

**Through:**

- Organizing and Participation in ISARC-events
- Participation in ISARC's
- Active membership in IAARC community committees
- Website and Newsletter
- Contribution to Elsevier's AUTCON
- Association with leading organizations such as ASCE, CIM, etc.

**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
- Exposure to new trends and developments

- Exchange of state of the art knowledge/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)
- Access to the latest IAARC information
- Immediate updates of news and changes
- Participation in the annual meetings (ISARC conferences)
- Participation in regional meetings and workshops
- Active membership in community committees
- Influence on IAARC's objectives and its future direction
- Web links from the IAARC site to your web site
- Discounts for IAARC-supported activities such as ISARC conferences
- Exhibition rights at the ISARC conferences
- Newsletter

**Members from:**

Spain, Sweden, Japan, USA, Republic of Korea, Poland, Canada, The Netherlands, Germany, Israel, Finland, India, Taiwan, Australia, Italy, Slovenia, Lithuania, Luxembourg, Kuwait, UK, Russia, etc

**Membership form:**

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