The last 5 decades of robotics in prefabrication / On-site single task robots / Automated sites / Robotic interior for aging society / Next robotics for unstructured environment

RITSUMEIKAN



Speaker: Dr. Thomas Bock

Former Professor of Technical University of Munich

Date: September 18th, 2026

Time: 13:00-14:00

Venue: Large Conference Room, Core-Station 2F, BKC Campus, Ritsumeikan University, Noji-Higashi 1-1-1, Kusatsu

Invited by: Prof. SangHo Hyon (Dept. Robotics)

Abstract :

Kensetsu Rx first summarizes the automation and robotics in prefabrication since 1970s. Basically we differentiate between civil engineering and building construction robotics applications. But I prefer to combine both domains, since I studied both fields in Germany and USA and medieval master builders included both specialties. The first on site single task construction robots had been developed in Japan since 1978. I describe those pioneering construction robots, since I was involved in 50 developments during my doctorate studies at the university of Tokyo and internships at research institutes. Since 1988 the first automated high rise construction system has also been developed in Japan to which I contributed the notion of “ROD” Robot Oriented Design. I describe those systems in detail. Further similar technologies of automated and robotic construction systems had been developed for deconstruction of high-rise buildings for circular engineering and construction waste reutilization of about 93%. Due to demographic challenge of aging society, I explain my concept of life support system LSS which I proposed in research for Japan science society in order to facilitate independent and inclusive living by elderly assisted by robotic interior environments or furniture inspired by space stations. Also, a big potential will be construction robotics in space and extreme environments on earth. In future due to global urban expansion, I propose air borne drone construction system using those multifunctional “Gattai Kensetsu” Rx in a sky factory to be applied at congested metropolitan areas like Kansai and Kanto For future next generation robotics I propose inspirations from “Karakuri” and “Gattai” as a multifunctional future post-humanoid robotic system to generate future wealth of society.

Biography:

Prof. Bock ‘s global professional, academic and research activities focus since 1970s on industrialization of the construction and building sector towards automated prefabrication, robotic on-site construction and robot-oriented design. His notion of robotic ambience offers socio-technical solutions for ecological, economical and demographic challenges. An internship at Toyota Homes to study the TPS (Toyota Production System) rounded up his research in advanced prefabrication and the worldwide first 50 on site robots dissertation at the University of Tokyo. Since 1989 he was full professor till retirement in 2023 from TU Munich. He co-established first symposia, commissions, associations, journals etc. on construction automation and robotics since 1979 and is member of several academies of sciences, holds various fellow, doctor and professorships since 1990. He co/authored about 600 articles in English, French, Japanese, Russian and German and published the world wide first book series on “Construction Robotics” with Cambridge University Press since 2015. www.rod.de bockrobotics@web.de