



Sculpture created using Kuka robots

# Kuka robots used to create sculpture

**Robotics in art**  
Interview with  
robotics fabrication  
pioneer Johannes  
Braumann

On July 5, an creative outdoor sculpture displayed at the exhibition hall of Tongji Architecture and Urban Planning College drew a lot of attention from students and faculty members. The "Swarm Fabrication", one of many digital fabrication projects on display at the DADA "Digital Factory" Workshop Exhibition, was not fabricated by human hands but completed by two collaborative Kuka robots.

More than 120 students spent 9 days at the week-long workshop to deliver a series of creative digital projects, covering robotics ceramic printing, robotics wood tectonics and robot team fabrication.

Professor Johannes Braumann, co-founder of Robot in Architecture Association and Doctor Yuan Feng from Architecture and Urban Planning College, Tongji University at the exhibition shared their insights on the potential of industrial robots in creative industry. (Johannes Braumann referred as "J" and Yuan Feng as "Yuan" in the interview.

**Q: Can you tell us more about the current development in using robots in architecture and creative industry?**

J: The application of robots in creative industry is still quite recent. But In the past ten years, we have seen quite rapid development in using industrial robots in architecture and design. Many companies in the creative industry

began to show increasing interests in robotics. As to the academic world, at the very beginning most activities were of experimental nature but now we see more and more serious projects involving industrial robots.

**Q: In architecture and creative, will robots play a different role compared to their application in manufacturing?**

J: In creative industry, designers are always trying new things and working on new projects, which means we need to provide them with flexible software that allows them to realize ideas in a very quick way. This also applies to academia and universities because they only have students there for a couple of hours each week so they have to be more efficient with time.

**Q: You led the development of Kuka|prc, a plugin that enables robot control from within architectural software. Can you tell us more about your cooperation with Kuka? Why choose Kuka robots to work with?**

J: I started the cooperation with Kuka Austria many years ago. They have seen potential and value of robots application in architecture and have been quite supportive for my research.

For me, Kuka robots are well designed and I like the way they work. This may just be my personal opinion but I do think the design of Kuka robot has a large appeal to people in the design world. In terms of the interface, Kuka's control panel is also nicely designed so even for those outside the engineering world, it is still accessible.

**Q: Rob|Arch conference next year will be held in Australia. Will it be possible for the conference to come to China?**

J: Robots in architecture is an industry association fund by me together with Sigrid Brell-Cokcan. In 2012 and 2014, we held conferences in Vienna and Michigan respectively. Next year, we will hold the third conference in Melbourne, which will be the first time we have this event in Asia. We have gain a lot of support from local universities like Sydney Universities and RMIT. I certainly think it is possible for us to hold this conference in China. This is why I wanted to work more with Kuka China to know local projects and companies.

**Q : Do you see yourself as engineer, architect, programmer or mentor?**

J: In fact I'm not coming from engineering or computer science. I'm from an architect. I think my architecture background is quite beneficially as I won't be confined by certain rules and I understand the unique needs of architecture. As to my role, I really this it is a mix of educator and engineer.

**Q: Tongji University is a leading institution in architecture and engineering education in China. What is your view on robot's application in this area?**

Yuan: In recent years, we have seen the trend of use of robots in cross-industry applications increasing. People in the creative industry start to see possibilities brought by this technology. In creative sectors, industrial robots can be seen as a new media or platform. They are "empowered" by human brains and they can do lot of work that can't be done by human hands.

**Q: How do you see China in terms of robots application in design and architecture? Will there be more cooperation with Robots in Architecture ?**

Yuan: In China, only three architecture and design institutions have industrial robots. Our Rob Team of two Kuka robots have done many creative projects in the past three years. ●



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