

Title	I'd like to interact with society through dynamics and control technology : listening to what associate professor Masaki Takahashi says
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## I'd like to interact with society through dynamics and control technology.

Using the model base control technology and by digging up latent needs of people, Mr. Masaki Takahashi pursues the creation of products and systems truly needed by people and society. In his students' ages, sports were the focus of his enthusiasm. He confesses that, though he was good at mathematics and physics, he was skeptical about why he was learning these subjects. But a lecture he received at the university class awakened his interest in dynamics and control technology, which brought him into a life of scientific research day and night. But his style of research pursuit has been inseparable from interaction with people and society. In fact, his sphere of activity extends far beyond his laboratory, with his eyes always directed toward the outside society.

### What kind of life did you live as a student?

Recalling those student days, I was totally absorbed in soccer and skiing. I took up soccer as an elementary school boy. I was enthusiastic about this sport because eleven members playing their respective roles in a team play was great fun. As such a soccer-focused school boy, it was beyond imagination that I would choose a career as a researcher in the future. While I'm now specializing in control engineering and dynamics, for me as a high school student physics was merely a subject "a bit more favorite than liberal arts-oriented subjects."

### Then, about when did you become interested in control engineering and dynamics?

I took an interest in these studies

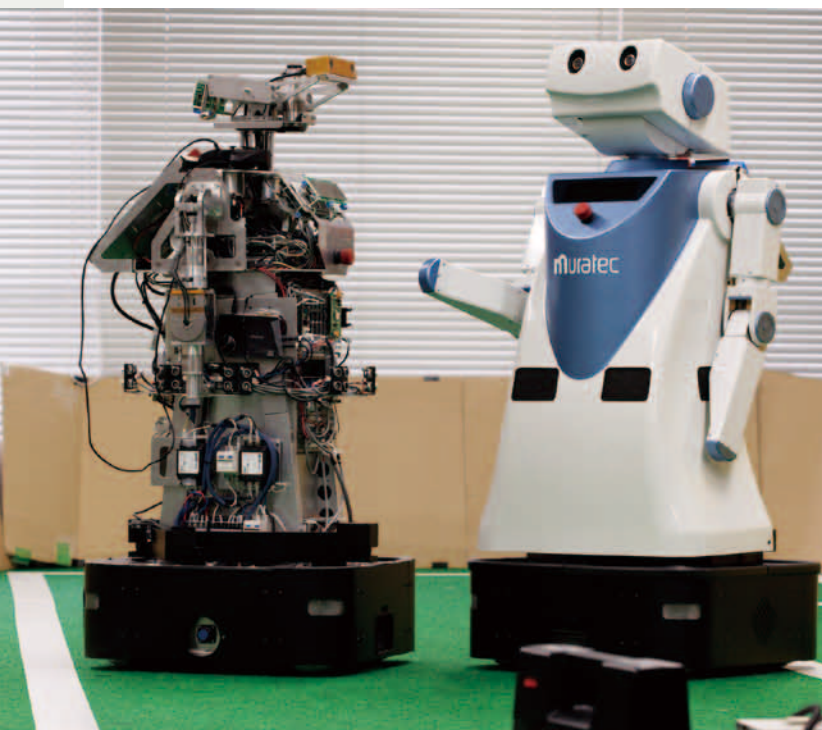
only after I was admitted to university. During my high school days, I couldn't imagine that scientific formulas written in textbooks could be actually useful for society, nor could I recognize that they are necessary to understand and explain various phenomena in our lives. I should have noticed it much earlier.

### You joined the System Design Engineering Department of Keio University's Faculty of Science and Engineering, right?

Yes. To tell you the truth, I was one of the first students who were admitted to the then newly established System Design Engineering Department. There was a description on the department's brochure: "To create systems geared to the forthcoming society, knowledge from both mechanical and electrical studies is

required. As such, the department aims to foster talents capable of designing, analyzing and evaluating systems." Without any mental resistance, I could agree to the concept of designing an overall system by combining knowledge from different fields of study.

When I was a freshman, this newly born department was not equipped with everything. But we students enjoyed the privilege of being taught by marvelous teachers who lectured us with great enthusiasm and ingenuity, which more than made up for shortage of equipment. In particular, lectures on dynamics and control engineering were so impressive that they revolutionized my awareness. My supervisor, Professor Kazuo Yoshida, was responsible for these lectures. He was kind enough to explain, in an easy-





to-understand way, that mathematics and physics, which I had studied at high school, and the laws of dynamics I was then going to learn at Keio could be used as useful tools for society and were actually being applied to various business and industrial forefronts.

Mathematics and physics – the fields where I was merely interested in solving problems – actually have much to do with our daily lives . . . it was a surprising aspect of physics. This experience motivated me to know more about physics.

**Professor Yoshida's remarks brought a drastic turnaround in your impressions about physics, right?**

During his first classroom lecture, Prof. Yoshida showed us a video footage of the Tacoma Narrows Bridge in the State of Washington, U.S.A. This bridge collapsed soon after completion due to wind, strong but within the presumed velocity limit. This vivid visual record of the accident made the bridge famous. Many of you may still remember it. It was the very moment I became strongly aware of the role dynamics and control technology play.

The impressions I received at that time were so strong that, when the time came for me as a junior to decide which lab to choose from, I visited Prof. Yoshida's lab and, after observing what was going on, decided to study under Prof. Yoshida. When giving lectures, he was usually soft spoken and did his best to explain things in an easy-to-understand way. But when it comes to research activities, he was very serious, giving sharp and pinpoint criticism and advice as necessary. Now finding myself in a position to guide students, I would like to follow Prof. Yoshida's example. But it's difficult and I'm striving from day to day.

To my great regret, Prof. Yoshida passed away in 2008; I can no longer listen to his valuable views. What I can do now is to do my best to approach Prof. Yoshida's level by following his advice.

**What else do you bear in mind as a university teacher?**

I'm trying to arrange so that activities of my students will not be confined to the lab but interact more and more with the outside world. In my opinion, exchanges with other universities and interaction with foreign people will prove valuable not only for their research activity here, but also for their lives even after graduation. For example, my students' off-campus activities include participation in a space-related event held in Noshiro City in Akita Prefecture, and an event (ARLISS) in the Black Rock

## Challenging the creation of comfortable lifestyles with control engineering and dynamics

### Masaki Takahashi

With control engineering and intelligent control engineering as his specialties, Mr. Takahashi uses model base control technology to address research themes relating to mechanical control, intelligent robotics and space engineering, among others. He obtained a doctor's degree at Keio University Graduate School of Science and Technology in 2004. He became a postdoctoral research fellow at Keio University in 2004, a research associate at Keio's Faculty of Science and Technology in 2005, an assistant professor in 2007, and the current position as an associate professor in 2009.



Desert, Nevada, U.S.A. that features the use of a rocket to launch a simulated satellite and recovering it. Another example is a student-initiated experiment class for flying PET bottle rockets as part of our Campus Festival.

The experiment class targeting elementary school children allows them to learn and experience the mechanism by which rockets can fly, as well as the phenomenon in which the distance of flight varies according to changing the angle of the rocket's trajectory. I believe experiencing things themselves will remain as lasting impressions. When these children grow up and learn physics at high school, they may be able to develop their interest in this study if they can relate the theory to their past experience, saying "Now I understand why my rocket could fly at that time!" I would also like my lab students to realize the difficulty of teaching things to others. **Do you have any person who remains particularly outstanding in your memory?**

There is a famous robot specialist in an Italian university. An encounter with this researcher was really impressive. At that time I had just obtained a doctor's degree. But the moment he learned that my specialty was control engineering,

he approached me saying, "I'd like to discuss with you since, as a specialist in information engineering, my knowledge of control engineering is limited." His attitude was very open, which made the discussion a very beneficial opportunity for information exchange. When you have thoroughly pursued your own specialty field, you inevitably find areas of study you need to know more about. At that time I realized that we need not feel ashamed of such lack of knowledge and that it is important for us to maintain our own specialist perspectives. I would like to convey this message to my students.

◎ Just a word from . . . ◎

● A student: Mr. Takahashi is a truly reliable teacher, patiently and attentively watching us at all times and giving appropriate advice casually but precisely when needed. What's more, he maintains a marvelous sense of balance as he well understands our part-time jobs and job-hunting activities.

(Reporter & text writer: Kaoru Watanabe)

For the full text of this interview, please refer to:

<http://www.st.keio.ac.jp/kyurizukai>

