

Love of Robots Makes for Strong Team Bonds

In November each year, the Robocon (Robot Contest), a national contest for technical college robot-building teams, is held and the competition is broadcast nationwide on NHK public television. This contest is the focus of the passions of talented young people who devote their energies to creating hand-made robot devices. In this issue we interviewed the robot contest team of the Tokyo National College of Technology that competed at the regional level and went on to the national competition in both 2005 and 2006, introducing the activities of the members. TJJ asked some of the members what they learned from the experience.

Love of Making Things Got Me Interested

—What made you decide to participate in Robocon?

Toshihide: Ever since I saw a Robocon on television when I was in kindergarten, I've been a Robocon maniac. When I was little, I loved the way the robot could move. When I entered junior high school, I made up my mind to go to technical college just so I could enter the Robocon.

Ryosuke: I love robots that will clean or take care of your house while you're gone—any kind of robot. Robots are kind of cute and full of fun. I entered technical college expressly so I could participate in Robocon.

Hiroshi: I saw the Robocon on television and, since I wanted to participate, I chose technical college.

Yusuke: I've loved doing intricate things with my hands since I was little. I used to take apart old radio-cassette players and fix bicycles and furniture. I got into technical college that way, but then I found there wasn't much I could do with my hands. I really wanted to make things, and that led me to join the Robocon team.

—Please describe some of the difficult things you encounter and some of the things you most enjoy in your activities.

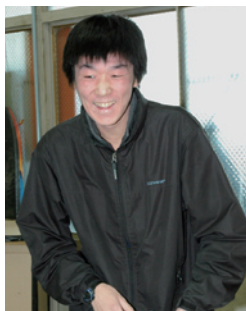
Hiroshi: Just before the tournament, we're here working until the last train home every day. Some of us live an hour a half away, so we sometimes don't get home until 1:00 in the morning, but we have class again from the next morning. We don't think much about such hardships, though.

Ryosuke: Actually, more than half of those who joined in 1st year have quit. Those who have stuck with it love robots so much that they forget the time when they are working on them. Sometimes you think it's only 9:00 at night and suddenly it's midnight (laughter).

Hiroshi: One of the hard parts is how a robot can get broken because of a mistake in design.

Toshihide: But when a robot moves exactly as you planned—that's really cool!

Ryosuke: When you know how it feels when you succeed, you'd go to any lengths to make a better, finer robot.



Toshihide
Leader of the 2006 Team. Specialist in design and robot operation. Crazy about the Robocon from kindergarten. Unsurpassed when it comes to operating a robot. 4th year.

—Are there connections between your robot making and what you are learning in class?

Yusuke: We can use the technology we learn in class and make it really ours when we build these robots. For example, we can get practice using machine tools by making parts for our robots.

Ryosuke: Another good thing is that we can apply principles that we learn in class in actual practice. Our *senpai* immediately feed into the club the latest information they've just learned in class.

Collaboration Through Trust

—I see that you have divided up responsibilities, with Toshihide taking charge of design and operation, and Ryosuke and Hiroshi in charge of construction. Is the leader the person who coordinates everybody's ideas and sets your schedules?

Yusuke: I was the 2005 Team Leader but I don't remember getting up in front and acting much like a leader. Each of us has certain things we take responsibility for and we just end up working together that way.

Ryosuke: Each one of us has something we're especially good at, like Toshihide with the robot operation and manipulation, Yusuke, who's really good at detail work, and so on. When you know that everybody is passionate about the Robocon, you don't have to worry; we know we can trust each other. There isn't much sense of hierarchy among us, although we call our seniors *senpai*, but otherwise we are pretty open and frank with each other.

—Do you ever come in conflict with each other?

Hiroshi: Of course. Sometimes we have an idea but we can't convince the others, so then the only thing to do is to actually make what we have in mind. So I might say, "Okay, I'll make a robot with my idea, and you make the one you're thinking of, and we'll use the one that performs best." So it's give and take, and we use the robot that has the best chance of winning.

Yusuke: Once we were making a robot that would stick balls on a target with a velcro surface. We had two ideas. One was to use a hand device that would grip the balls, like a "magic hand" - or



Hiroshi
2006 Team member in charge of design and construction. A cheerful "mood maker" for the team. 4th year.

“UFO catcher”-type grabbing arm (such as found in the game arcades), and stick them on accurately, though perhaps only a few at a time. The other was to use a large board-like hand covered completely with velcro with which many balls could be stuck on all at once. We discussed the two ideas but we couldn't agree. We made test robots and found out that the second design actually worked well and even more effectively than we thought, so we used the board hand idea. If we make a test robot we can determine whether what we thought in principle was a good idea would actually work, and those who backed the ideas that don't work are therefore convinced.

Ryosuke: When we compete in the contest and something goes wrong, we sometimes realize only then: “Darn, if we'd only noticed that when we were building the robot.” When we discuss something together and come to a conclusion, but then turn out to be wrong, what can you do? You have to accept it. As long as you take a lesson from such mistakes in the next thing you do, that's just the way it is.



Ryosuke

2006 Team member in charge of construction. Also uses his social skills for Team PR. 4th year.

—What are some of the things you have learned in the process of entering the Robocon?

Yusuke: I myself learned that I have to assert myself if I want my idea to be used to make the team's robot. Of course, you have to be willing to listen to other people's ideas, too, or you end up just squabbling, saying things that don't help much, and not finding a solution to the problem. I think I also learned better to listen to what other people have to say.

Ryosuke: Yes, I think we have learned to talk things over well.

Hiroshi: Back in junior high school, kids used to tease and bully me, and I had gotten so I kind of avoided contact with others. I didn't say a word for about two years after joining the Robocon team. But I've changed a lot because I've learned to trust the other members of the team and know I can talk with them frankly.

Toshihide: And now Hiroshi is the mood maker of the team. When we get down and depressed, he's the one who does something to cheer us up and encourage us to keep going.

We Want to Make Robots That Will Help People

—Please tell us what you want to do in the future.

Toshihide: I don't have any specific idea, but I do hope I can find a job in which I can put the experience I've had with the Robocon to some use.

Ryosuke: My hope is to make a really cool-looking robot.

Hiroshi: I want to make rescue robots or care giving robots—the kind that will be directly useful to people in their daily lives.

Yusuke: I want to find a job with a small- or medium-sized parts manufacturer, not a big manufacturer. I don't want to be just one replaceable cog in the wheel of a big enterprise but work for a smaller firm where I can advance my own ideas and see things happen that I have worked on. I want to be directly involved from the design to the production stages. I think I got this idea that I want to “do it myself” from having worked on the Robocon team.

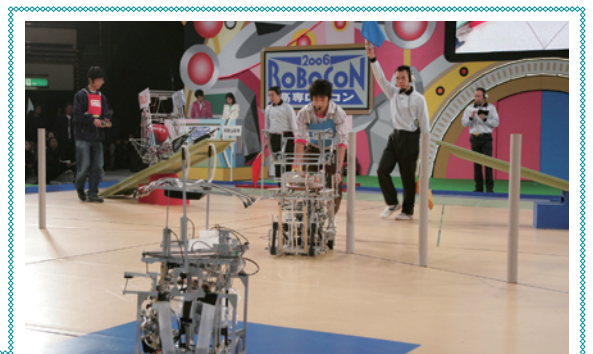
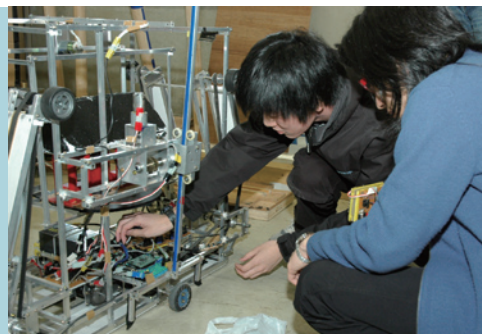


Yusuke

2005 Team Leader. In charge of design. Loves to work with his hands. 5th year.

Tokyo National College of Technology's 2006 Robocon Robot

This robot made it to the national tournament, but unfortunately lost in the first match there. Beautifully performing a feat of triple jump rope that is difficult even for a human, it drew close attention at the contest that focuses on technical skills.



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What is the Technical College Robocon?

Formally called the College of Technology Robot Contest, it is a competition by the tournament method among teams of students at five-year technical colleges* who build robots on an assigned theme. Sixty-one technical colleges in Japan participate in the contest, which is now in its twentieth year, having been held annually since 1988. Two teams (of 3 members each) can enter from each school, competing first in regional tournaments held in 8 national districts. The top 25 teams winning in these tournaments compete again at the national contest.

In the 2006 contest, robots crossed a moat, negotiated across a seesaw, moved along a zig-zag path, and jumped rope using fresh technical innovations to carry a load of local specialty products to the goal in record

time. Many unique ideas were devised. For the jump-rope feat, some robots jumped not just once but multiple times on one go, or did somersaults while jumping the rope.

Official Robocon website <http://www.official-robocon.com/top.html>

*Five-year technical colleges: In contrast to high school, which is three years, technical colleges (*koto senmon gakkō*; “kosen” for short) provide five years of schooling after junior high school. They offer special technical training in such skills as industrial design and aviation. Graduates receive credentials equivalent to a junior college diploma and are eligible to apply for transfer to a four-year university as a third-year student.