Introduction of Our School

School name:	National Institute of Technology, Toyota College （豊田工業高等専門学校）
School address:	2-1, Eisei-cho, Toyota Aichi, JAPAN （愛知県豊田市栄生町 2-1）
School URL:	http://www.toyota-ct.ac.jp/english/
PR message:	We contribute to industry with a frontier spirit. （開拓者精神をもって工業の発展に寄与します）

What's National Institute of Technology
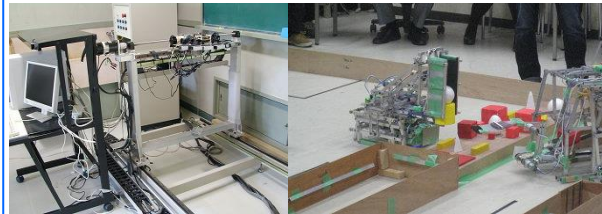
Various five departments of engineering

■ National Institute of Technology has two major characteristics. In first, it provides an engineering education to students who have graduated from junior high school. Its educational style is not only composed of technical lessons but of the liberal arts, which are compiled in a well arranged curriculum for **five academic years**. In second, the practical aspect of engineering is emphasized through many credits of experiment. It aims to train young students to be outstanding engineers with practical abilities as well as scientific viewpoints.

About NIT Toyota College

■ Toyota College was established in April, 1963 in the city of Toyota, which is a significant center of the automobile industry in central Japan. The **advanced engineering course** was added as a two-year course in our college system April, 1994 to qualify Bachelor Degree following the five-year college course. The students have the opportunity to acquire research experience in developing new engineering products or systems and to create new technologies for future generations.

■ Attractive club activity, official event mainly planned by student council (ball games, field and track events etc.), and wonderful dormitory life (about 60% of all students including 9 overseas students as of 2017)

■ Many courses after graduation: Employment in Japanese major company (JR Tokai, Denso, Chubu Electric Power, NHK etc.), Graduate's Entrance into Universities (Nagoya Univ., Tokyo Inst. of Tech., Nagoya Inst. of Tech., etc.)

■ International institution for technological education : This college acquired an accreditation by JABEE (Japan Accreditation board for Engineering Education)

◆ **Department of Mechanical Engineering**

◆ **Department of Electrical and Electronic Engineering**

3rd place (2012), 4th place (2010 ,2011) at RoboCup world

◆ **Department of Information and Computer Engineering**

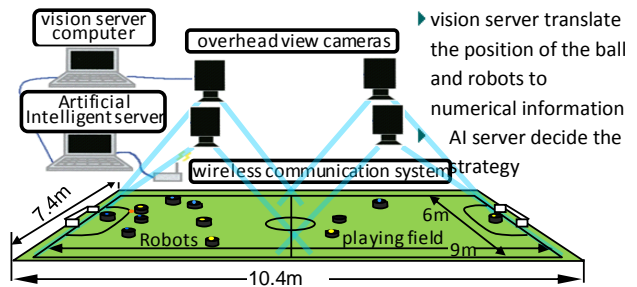# School name: National Institute of Technology, Toyota College

◆ Department of Civil Engineering

◆ Department of Architecture

vision server translate the position of the ball and robots to numerical information
AI server decide the strategy

Omni-directional wheel

It is required the wheel mechanism realized Omni-directional moving with high speed in the game.（It is quite different from conventional wheel which cannot rotate at the site）.

Kicking device

After the large capacitors built up the high voltage(～200V), the energy is released explosively to the electromagnet coil. As the results, the iron core is pulled into the coil, and the powerful shoot is achieved.

Theoretical calculation

Introduction of RoboCup as our Lab's study

What's RoboCup?

➢ RoboCup is an international research and education initiative. It is an attempt to foster AI and intelligent robotics research by providing a standard problem where wide range of technologies can be integrated and examined, as well as being used for integrated project-oriented education. For this purpose, RoboCup chose to use soccer game as a primary domain, and organizes RoboCup.

➢ **The Dream**
By mid-21st century, a team of fully autonomous humanoid robot soccer players shall win the soccer game, against the winner of the most recent World Cup, comply with the official rule of the FIFA.

➢ Recently, there are many participants from Asia and Middle East. Main country of participants in **2017**: USA, Germany, Brazil, Japan, China, Iran, Northern Cyprus, Netherlands, Canada, Columbia, India
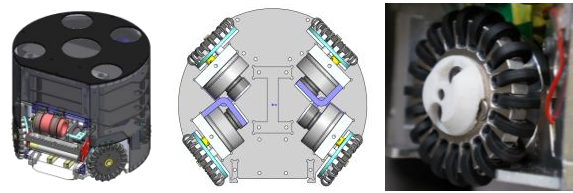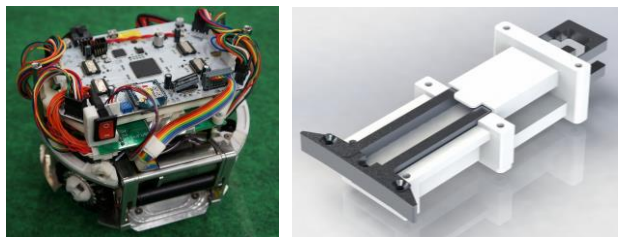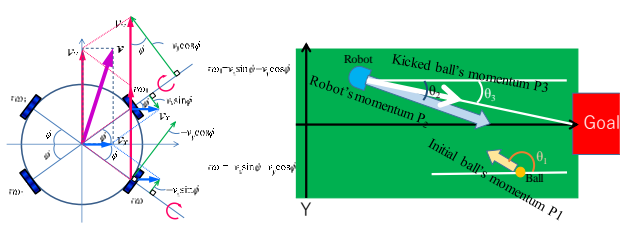
What's Small Size League of RoboCup?

● League playing the soccer game by using six robots (cylindrical robot size of diameter18cm×height15cm)
● Using of Global vision systems which look over the whole playing field (Field size is about 9m×6m)
● SSL-Humanoid was established in 2009 at Japan

Results (RoboCup Soccer small size league)

▶ Japan Open SSL
• 1st place(2010,11), 2nd place(2007,09,12,14), 3rd place(2006,13)
• Humanoid 1st place(2009-2011,2016), 2nd place(2012)
▶ World Competition SSL
• **3rd place 2012(Mexico)**,
• 4th place 2010(Singapore), 2011(Turkey), Top8(2007,2009,2013), Top12(2006,2014-2017)

2012 3rd place Mexico