IRH 2015

Group3
Utsunomiya Technical high school

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Theme3
Most advanced technologies of robots

Field survey
Questionnaire about most advanced technologies of robots

Most advanced technologies of robots

Question

Q1 What kind of the robot?
(select/ describe)

Q2 What is the main Control technology?
(describe)

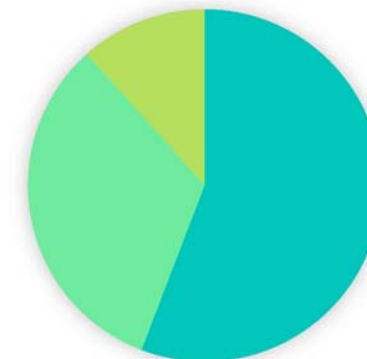Q3 What is the thing necessary for a robot? (4-choice)

Q4 What do you want to robots in the future? (describe)

Result

Q1 What kind of the robot? (select/describe)

- Industrial robots
- Parsonal robots
- Others

Others 5

Parsonal robots 14

Industrial robots 24

Result

Personal robots

- Feed back   **6**
- Sequential control   **2**
- Encode control   **2**
- Open loop control
- Inverter control
- Position tracking
- Sensors(Camera、RV、Infrared sensor、Distance sensor、LRF、KINECT)

Result

Industrial robots

- GPS
- Sequential control   **11**
- Feed back   **12**
- Inverter control   **3**
- Open loop control
- Encode control   **13**
- Position tracking   **8**
- Image processing   **3**
- Sensors(Tilt sensor、Wireless sensor、Acceleration sensor、Angular velocity、Position sensor、TVS、Force sensor、3D sensor、Light sensor)

Result

Others

- Sequential control
- Encode control
- Position tracking
- Sensors(Angle sensor)

Result

Personal robots

Easy Operation, Design, Safety, Reliability, Cost, Power

0% 20% 40% 60% 80% 100%

■ Agree ■ Somewhat agree ■ Somewhat disagree ■ Disagree
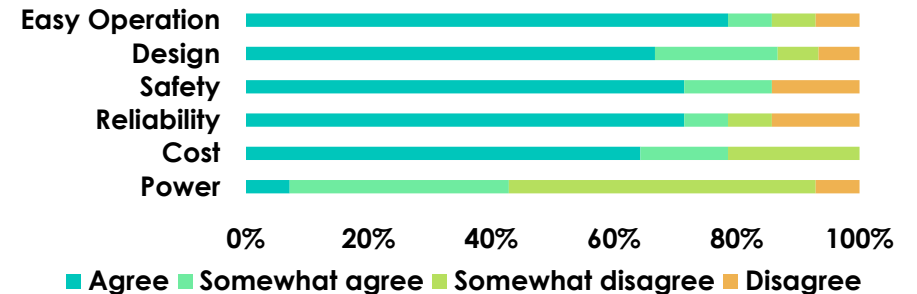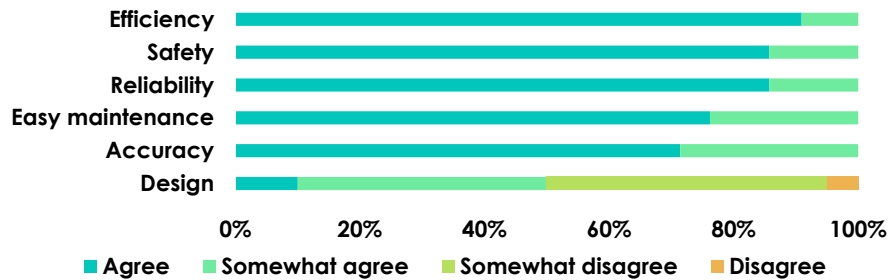
1. Easy Operation   2. Design   3. Safety

Result

Q3 What is the thing necessary for a robot? (4-choice)

Industrial robots

Efficiency / Safety / Reliability / Easy maintenance / Accuracy / Design

Legend: ■ Agree ■ Somewhat agree ■ Somewhat disagree ■ Disagree
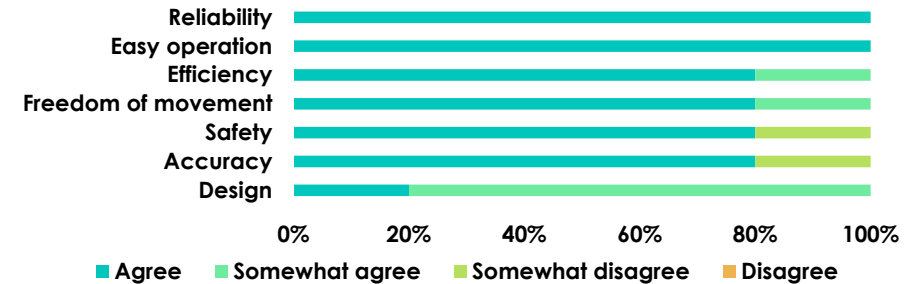
1. Efficiency   2. Safety   3. Reliability

Result

Q3 What is the thing necessary for a robot? (4-choice)

Others

Reliability / Easy operation / Efficiency / Freedom of movement / Safety / Accuracy / Design

Legend: ■ Agree ■ Somewhat agree ■ Somewhat disagree ■ Disagree

1. Reliability   2. Easy operation   3. Efficiency

Result

Q4 What do you want to robots in the future? (describe)

- **Compatibility with human** (9)
- **Movement like the human being** (5)
- **All automation** (4)
- **Cost cut** (2)
- **Diversification of the practical use environment** (2)

Consideration

● **Base Control technology ＋α**

● **Build To Order(BTO)**

● **Compatibility with human**

Preliminary survey

Evolution of most advanced technologies of robots

Most advanced technologies of robots

The history of robots

The 17th century

Karakuri-ningyo
appeared.

The history of robots

1928

The robot called
"Gakutensoku"
is developed
for the first time in Japan.

The history of robots

1967   **The industrial robot** begins to be made in Japan.

1984   The world's first **bipedal robot** is developed by Waseda University.

1986   Japanese robot accounts for **60%** of world robots.

1992   Waseda University starts "**The humanoid project**".

1993   **Bipedal robot** made in Honda is completed.

The history of robots

1996

Bipedal robot "**WABIAN**"
is developed
by Waseda University.

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The history of robots

1998

Personal robot "**R100**"
is developed by NEC.

The history of robots

1999

Pet robot "**AIBO**"
is released by Sony.

The history of robots

2000

Autonomy type robot
"**ASIMO**"
is announced by Honda.

The history of robots

2005

Seal type robot "**Paro**" is released.

Karakuri-ningyo

We made a modern version "Chahakobi-ningyo"
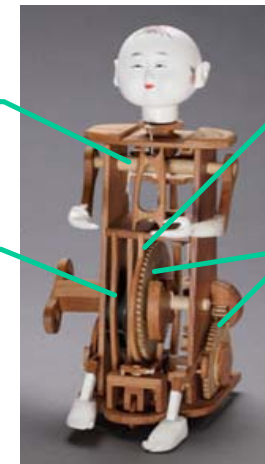
Preliminary survey

Chahakobi-ningyo

Chahakobi-ningyo
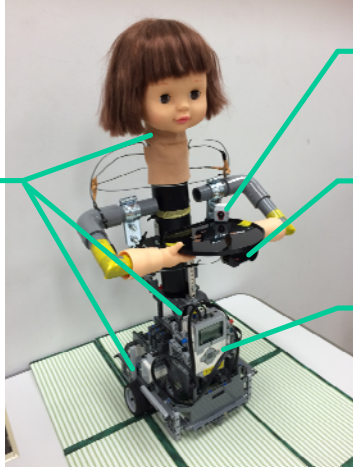
| Foliot | | Cam |
| Spring | | Gear |

Chahakobi-ningyo modern ver.
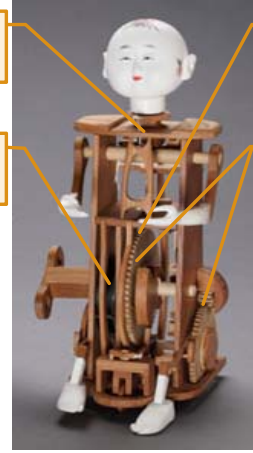
Light sensor

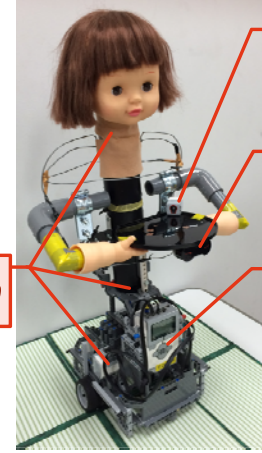Motor

IR sensor

CPU

Chahakobi-ningyo

Foliot

Spring

Cam

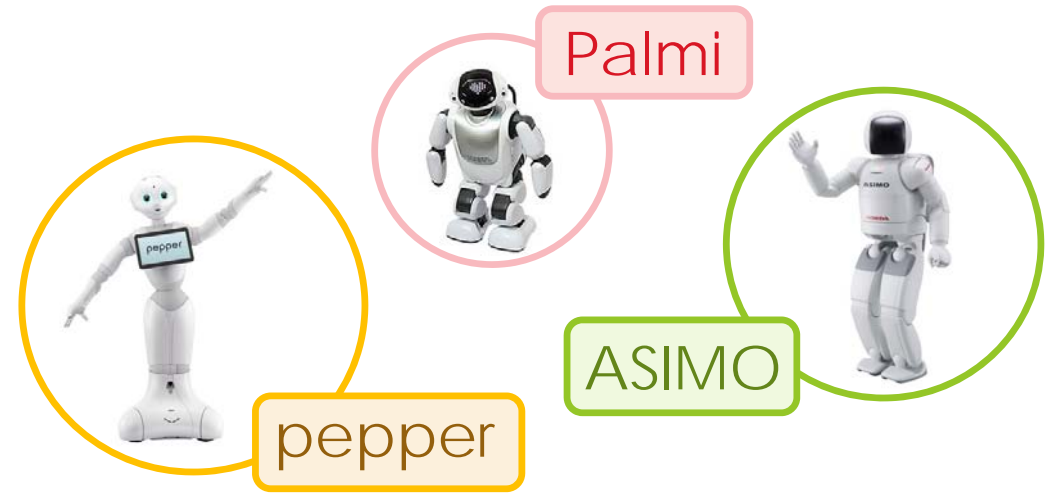Gear

Motor

Light sensor

IR sensor

CPU

Recognition of the traditional robot

Efficiency

Safety

Accuracy

Palmi

ASIMO

pepper

Compatibility with human