TU Robotics Team
Activity Report

December 14, 2018
Progress Report on Student Projects
Partly Supported by Boeing Higher Education Program
Nabeshima Eishu
Outline

1. About us

2. Our activities & results

3. Aims for the next year
Outline

1. About us

2. Our activities & results

3. Aims for the next year
1. About us – Who are we?

Our purpose...
“Enhance our engineering skills together through enjoying creating robots and other mechanical/electrical systems”

Consists of three branches...
Tohoku University Engineering Seminar: mainly software
Material System Seminar: mainly hardware
Autonomous Control Seminar: mainly electrical circuit
1. About us – Members

Leader: Shigeta Yuki (1st grade)

- **Grade**
  - 1st grade: 12
  - 2nd grade: 12
  - 3rd grade: 10
  - 4th grade: 12

- **Major**
  - Mechanical Engineering: 19
  - Informatics Engineering: 5
  - Other Engineering: 3
  - Science: 12

- **Gender**
  - Male: 42
  - Female: 5

- **Branch**
  - Hardware: 16
  - Software: 11
  - Electrical Circuits: 14
  - All-rounder: 5
Outline

1. About us

2. Our activities & results

3. Aims for the next year
2. Our activities

1. Create robots for robotic competitions
2. Create display items for exhibitions
3. Try to create whatever attractive

<table>
<thead>
<tr>
<th>Month</th>
<th>Event</th>
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<tbody>
<tr>
<td>Apr</td>
<td>InRoF (Sendai)</td>
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<tr>
<td>Jun</td>
<td>TU Spring Festival</td>
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<td>Aug</td>
<td>ABU Robot Contest (NHK)</td>
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<td>Oct</td>
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<td>Dec</td>
<td>ABU Robot Contest (NHK)</td>
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<td>Feb</td>
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2. Our activities – InRof

InRof: Intelligent Robot Contest Festival

Construct fully autonomous robots capable of:
- Tracking a route to the color balls on the field
- Picking them up and recognizing their color
- Putting them into the color-corresponding goals

Held in June 16th and 17th, competition for anyone

Purpose:
- Technical tutorial for freshman members
- Brainstorm of ideas for curiosity-oriented robots
2. Our activities – InRof

2018’s Result:
- Some team got points
- No team could advance the 2\textsuperscript{nd} qualifying match

Using linkage mechanism

Getting over the barrier

Robot inspired by ox cart
2. Our activities – InRof

1. Problems we frequently faced:
   - Shortage of parts strength & motor power to realize ideas
   - Time loss due to lack of movability
   - Sensor misconfiguration due to shortage of working time

2. Improvements for the next year:
   - Examine both practical and practicable ideas
   - Improve robots’ agility, precision & repro
   - Start earlier to ensure worktime for calibration
2. Our activities – ABU Robocon

Asia-Pacific Robot Contest

- Pass a shuttlecock to a robot from another robot and throw it to a ring whose height is 15 meters
- Held in August 26th, competition for universities
- Purpose: Try to build a large, highly sophisticated robotic system together with many co-workers
2. Our activities – ABU Robocon

1. Problem we faced:
   Throwing shuttlecocks to a ring stability

2. 2018’s Result:
   - Advanced to the 2\textsuperscript{nd} audition
   - Retired the 2\textsuperscript{nd} audition due to moving to our workspace
2. Our activities – Robot competitions

ABU Robocon:
- November to August
  advanced to the 2\textsuperscript{nd} audition

InRof:
- April to June
  couldn’t advance the 2\textsuperscript{nd} qualifying match

Improvement:
take part in too many competitions

Improvement for the next year:
Concentrate on InRof
2. Our activities – Exhibitions

University Spring Festival: April 14\textsuperscript{th}, 2018
University School Festival: November 2\textsuperscript{nd} ~ 4\textsuperscript{th}, 2018
Exhibit items attracting newcomer students/kids
Outline

1. About us

2. Our activities & results

3. Enrichment of our working environment
3. Enrichment of working environment

1. Band saw
   Cut material diagonally

2. Laser cutter
   Cut material boards for structural parts for robots
   Available materials:
   - Wood
   - MDF
   - ABS
3. Enrichment of working environment

3.3D printer

- Used to rapid-prototype parts of robots
- Available material
  ABS (Acrylonitrile Butadiene Styrene)
  PLA (Polylactic Acid)

4. Mechanum wheel

move left and right without changing robot’s stability
Thank you for listening!