

# TU Robotics Team Activity Report

**December 14, 2018**

**Progress Report on Student Projects  
Partly Supported by Boeing Higher Education Program**

**Nabeshima Eishu**

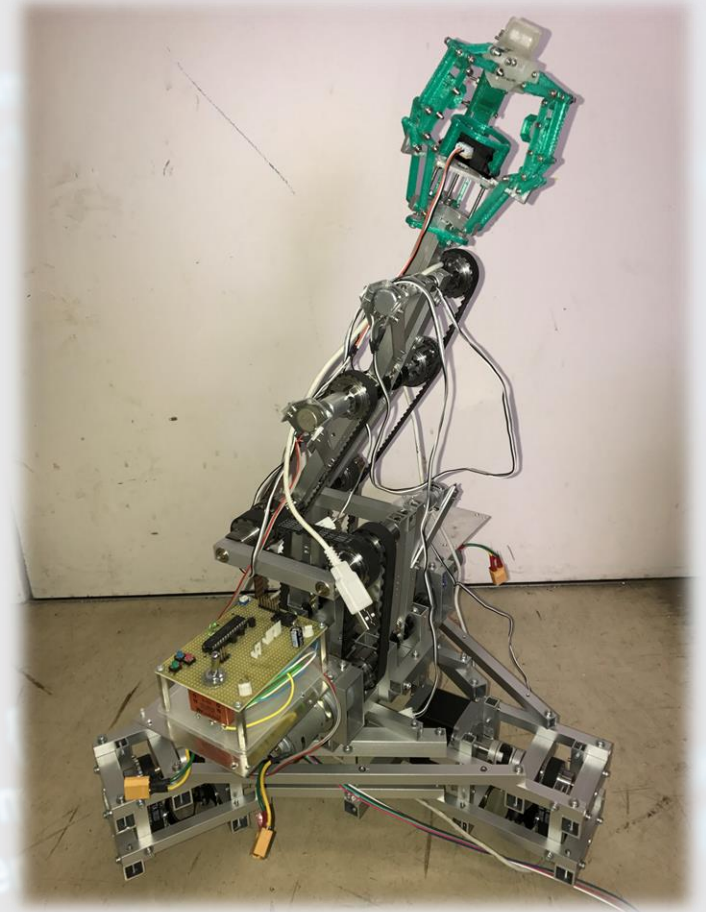


# Outline

1. About us

2. Our activities & results

3. Aims for the next year

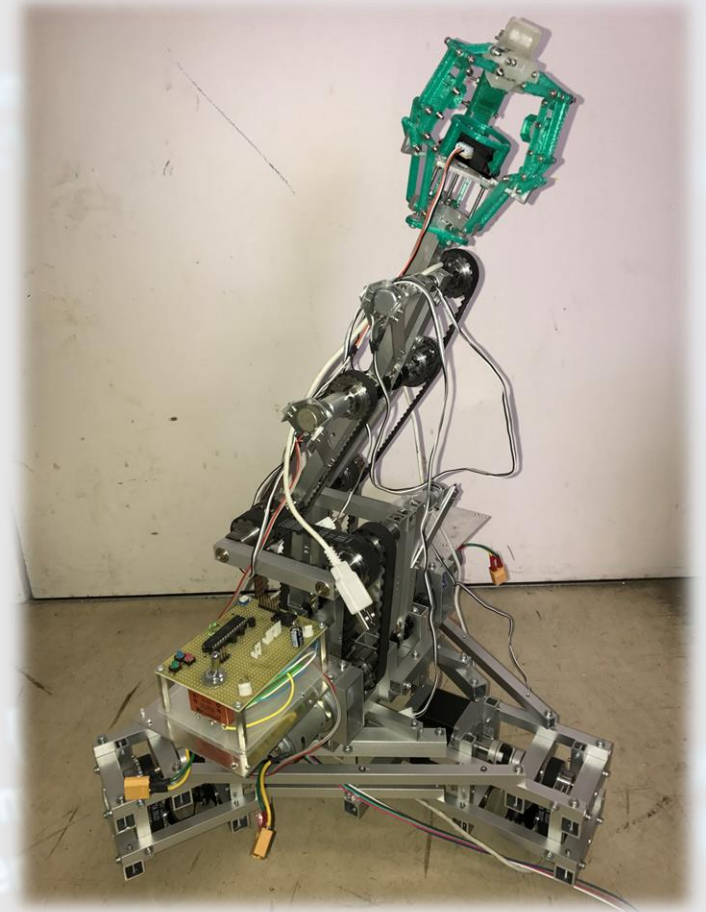


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# 1. About us – Who are we?

## Our purpose...

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

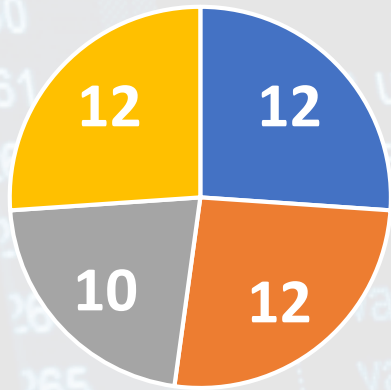
## Consists of three branches...

Tohoku University Engineering Seminar : mainly software  
Material System Seminar : mainly hardware  
Autonomous Control Seminar : mainly electrical circuit

# 1.About us –Members

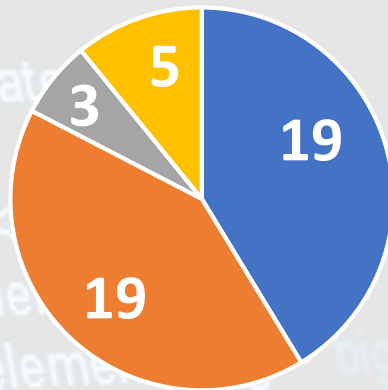
Leader : Shigeta Yuki(1<sup>st</sup> grade)

## Grade



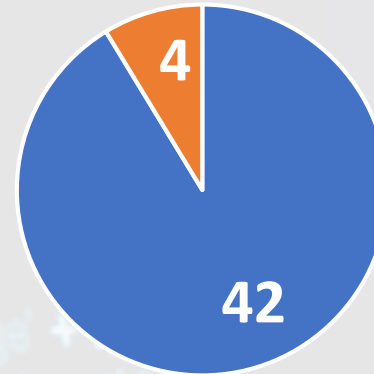
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade

## Major



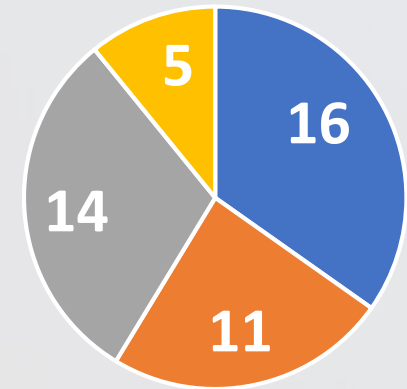
- Mechanical Engineering
- Informatics Engineering
- Other Engineering
- Science

## Gender



- Male
- Female

## Branch



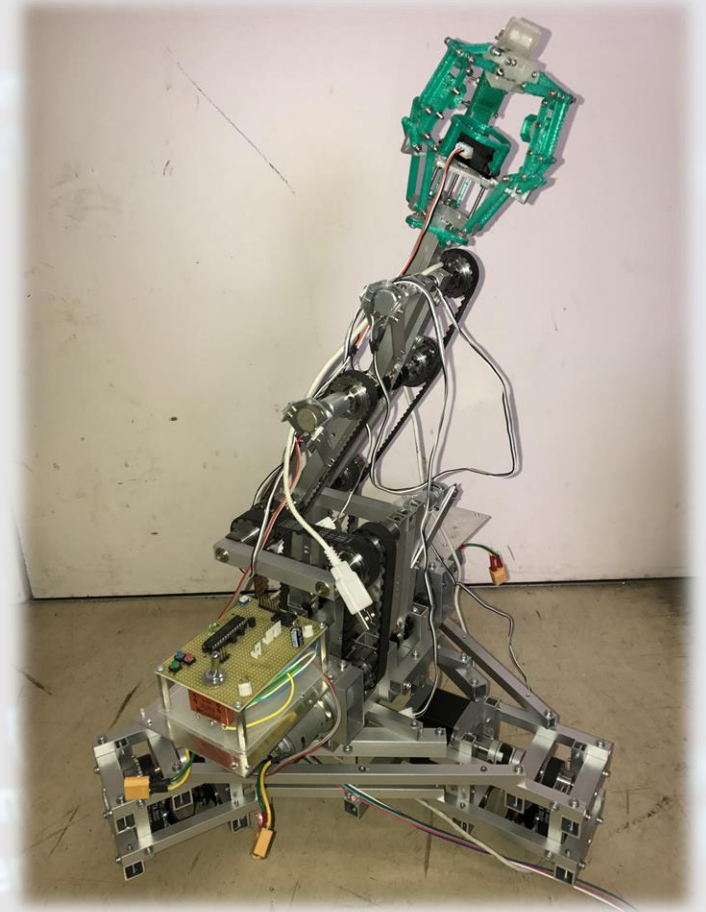
- Hardware
- Software
- Elicitrical Circuitis
- All-rounder

# Outline

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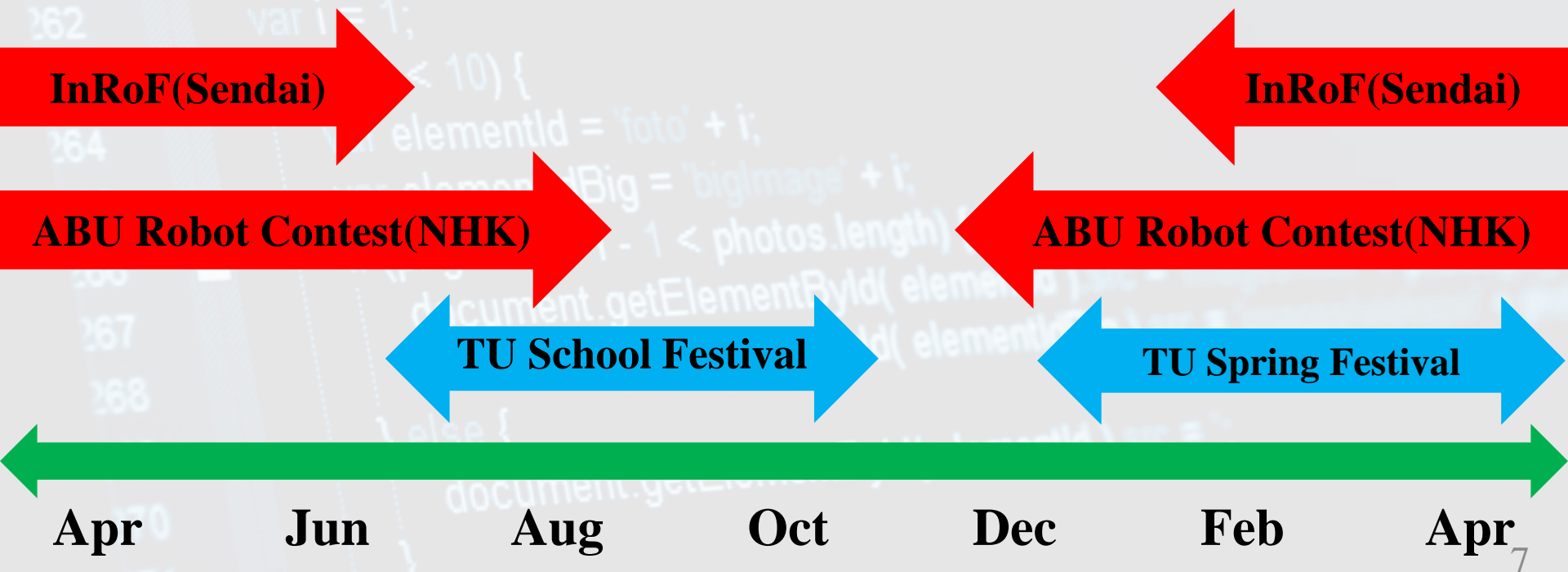
2. Our activities & results

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



## 2. Our activities – InRof

InRof : **I**ntelligent **R**obot Contest **F**estival

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 16<sup>th</sup> and 17<sup>th</sup> , competition for anyone

Purpose:

- Technical tutorial for freshman members
- Brainstorm of ideas for curiosity-oriented robots



## 2. Our activities –InRof



Using linkage mechanism



Getting over the barrier



Robot inspired by ox cart

2018's Result:

- Some team got points
- No team could advance the 2<sup>nd</sup> qualifying match

## 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 26<sup>th</sup>, competition for universities
- Purpose: Try to build a large, highly sophisticated robotic system together with many co-workers



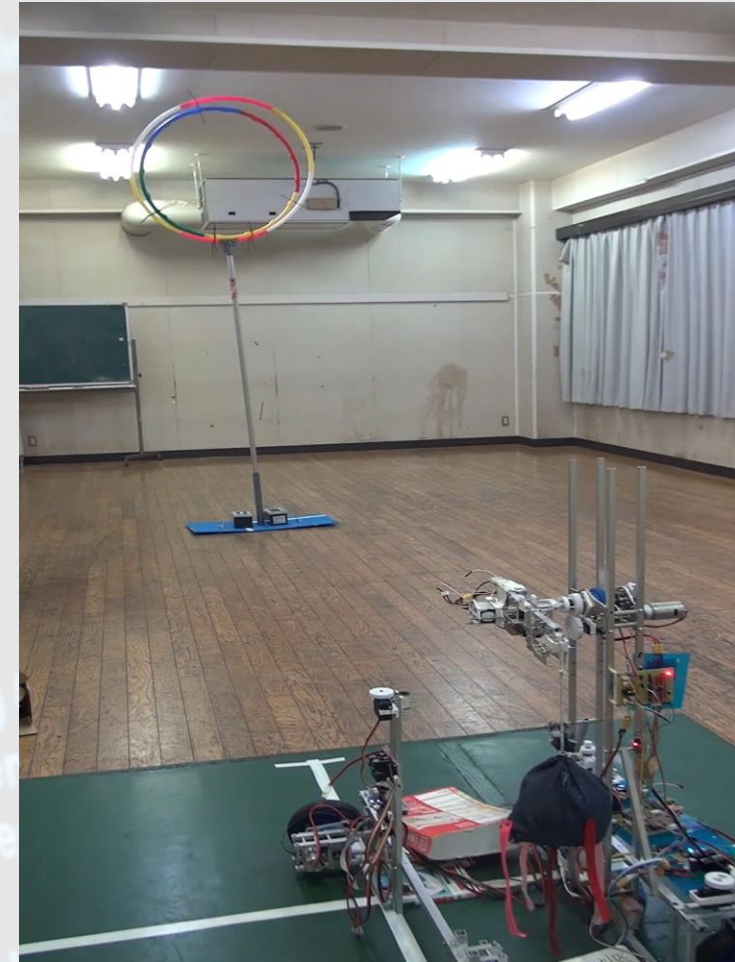
## 2. Our activities – ABU Robocon

### 1. Problem we faced:

Throwing shuttlecocks to  
a ring stability

### 2. 2018's Result:

- Advanced to the 2<sup>nd</sup> audition
- Retired the 2<sup>nd</sup> audition due  
to moving to our workspace



## 2. Our activities – Robot competitions

ABU Robocon :

November to August

advanced to the 2<sup>nd</sup> audition

InRof :

April to June

couldn't advance the 2<sup>nd</sup> qualifying match

Improvement :

take part in too many competitions

Improvement for the next year:

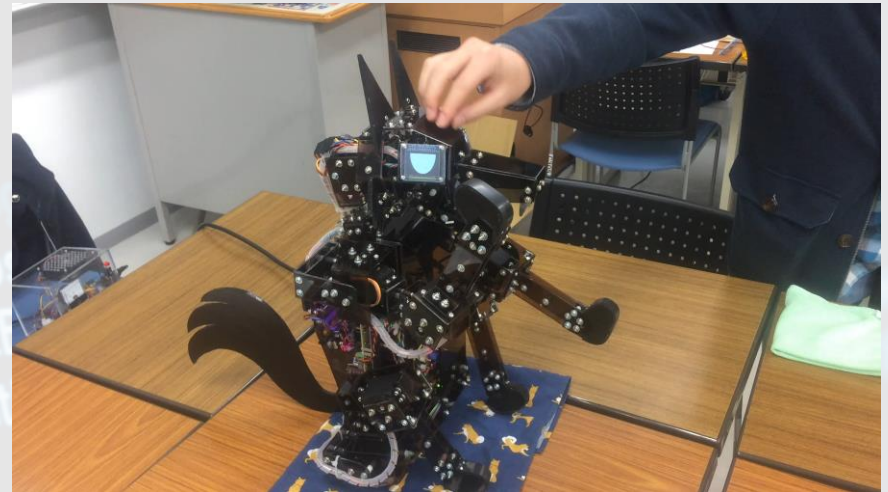
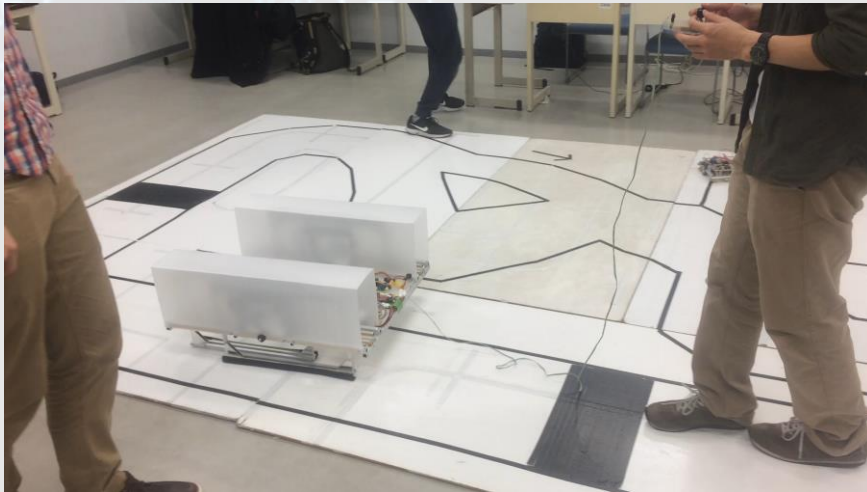
Concentrate on InRof

## 2. Our activities –Exhibitions

University Spring Festival: April 14<sup>th</sup> , 2018

University School Festival: November 2<sup>nd</sup> ~ 4<sup>th</sup> , 2018

Exhibit items attracting newcomer students/kids

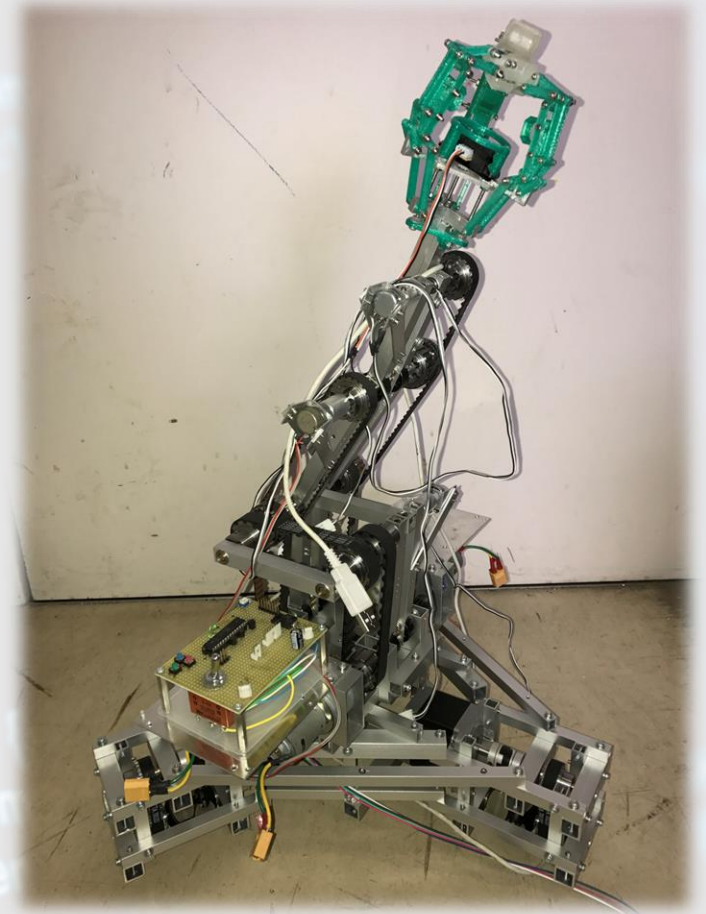


# Outline

1. About us

2. Our activities & results

3. Enrichment of our  
working environment



# 3. Enrichment of working environment

## 1. Band saw

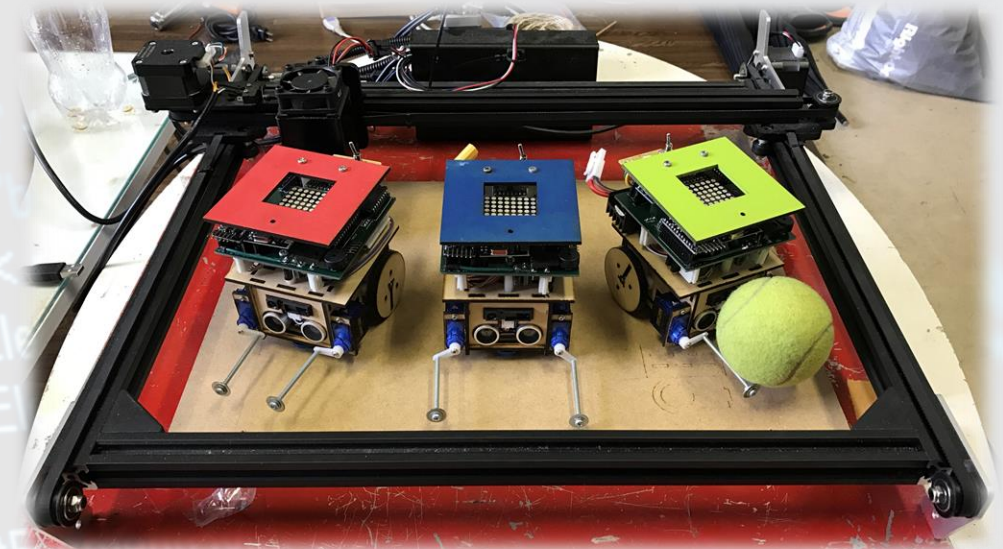
Cut material diagonally

## 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

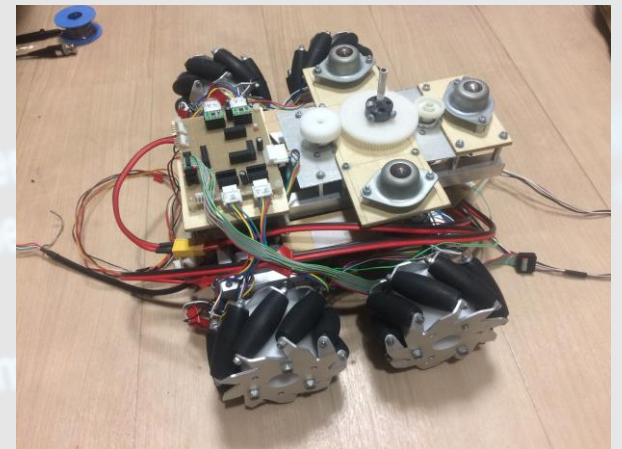
ABS(Acylonitrile Butadiene Styrene)

PLA(Polylactic Acid)



## 4.Mechanum wheel

move left and right without changing robot's stability



```
changePhotoDescription( cell ) {
    document.getElementById( bigimageDesc ) innerHTML = descriptions[ i ];
}

function updatePhotoDescription() {
    if ( descriptions.length > ( page * 9 ) + ( currentimage.substring( 0, 1 ) ) )
        document.getElementById( bigimageDesc ) innerHTML = descriptions[ i ];
}

function updateAllImages() {
    while ( i < 10 ) {
        var elementId = 'foto' + i;
        var elementIdBig = 'bigimage' + i;
        if ( page * 9 + i - 1 < photos.length ) {
            document.getElementById( elementId ).src = images[ i ] + photos[ i ];
            document.getElementById( elementIdBig ).src = images[ i ] + photos[ i ];
        } else {
            document.getElementById( elementId ).src = '';
        }
    }
}
```

# Thank you for listening!