

KAIST ME & NAVER Labs

Capstone Design 2018

Team 必勝

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Dongha Nam, Kyeongwon Park, Jeongseok Oh

Advisor:

Professor Philseung Lee | TA Sooyong Kim



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01. Team Name: 必勝
What does it mean and why?
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Mission and how
03. Solution System
System overview & Design
04. Expected Time Schedule
Dates & events
05. Thoughts & Comments
Unsolved | predicted Problems

必

Pronunciation: 필, Phill
Meaning: 반드시, Must

勝

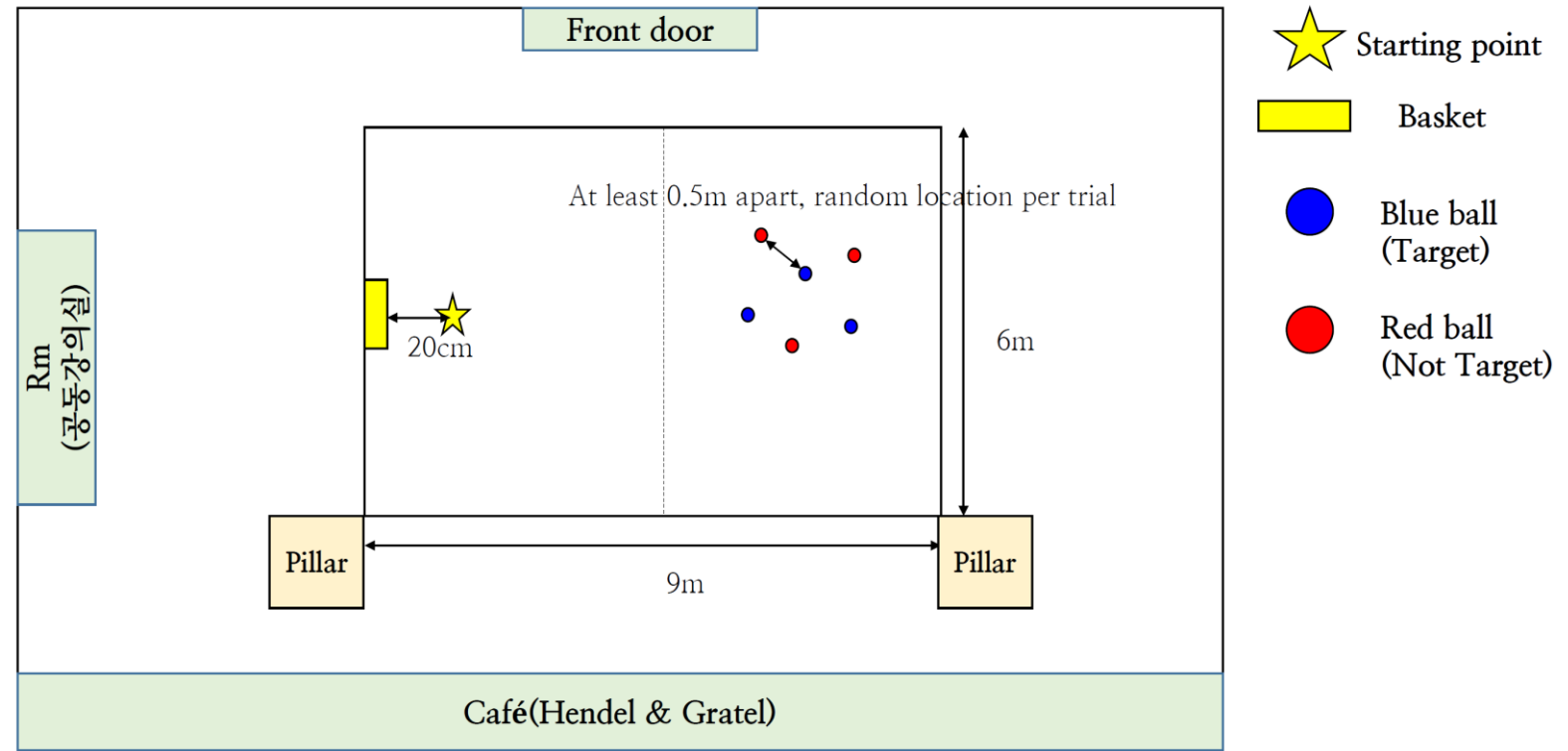
Pronunciation: 승, Seung
Meaning: 이기다, Win, Victory

01.
Team
Name:
必勝

必勝 in Chinese letter means **must, or will, win**. This represents our team's strong will to win the **first prize** with **professor Philseung Lee** in Capstone Design 2018.

Also it could be re-interpreted as 'feel-seung', which means '**feel victory**'.

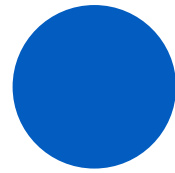
Collect blue ball_with high accuracy & speed & efficiency



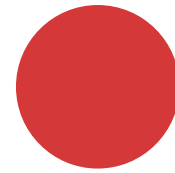
↑ Map of Mission Field

02. Problem Definition: Mission Statement

Rules



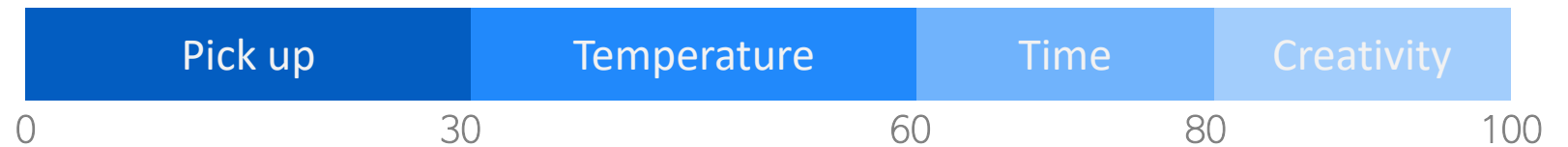
= +10 points



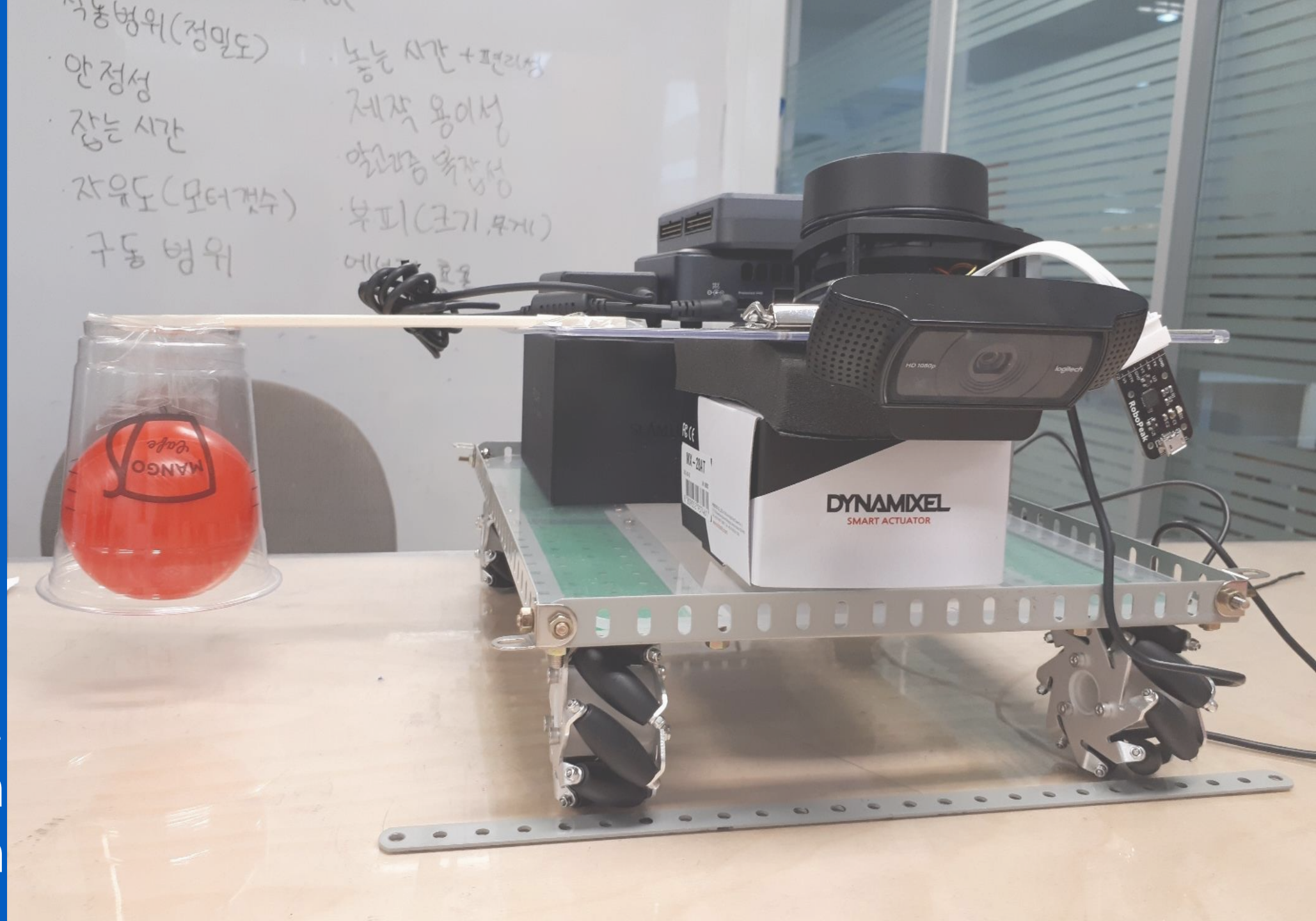
= -5 points

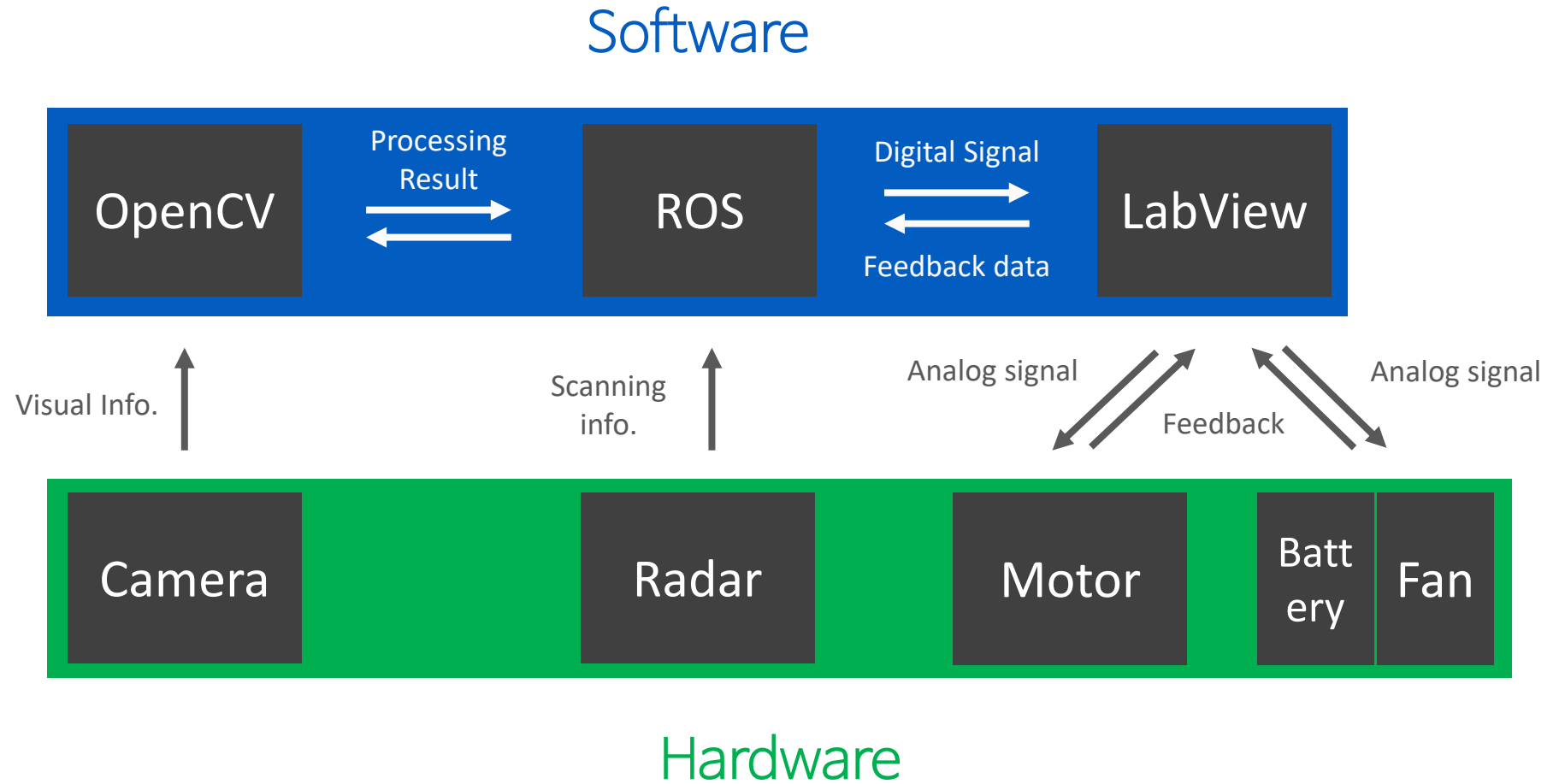
2 sets of ball position, 5 min time limit, 2 trials

Scoring



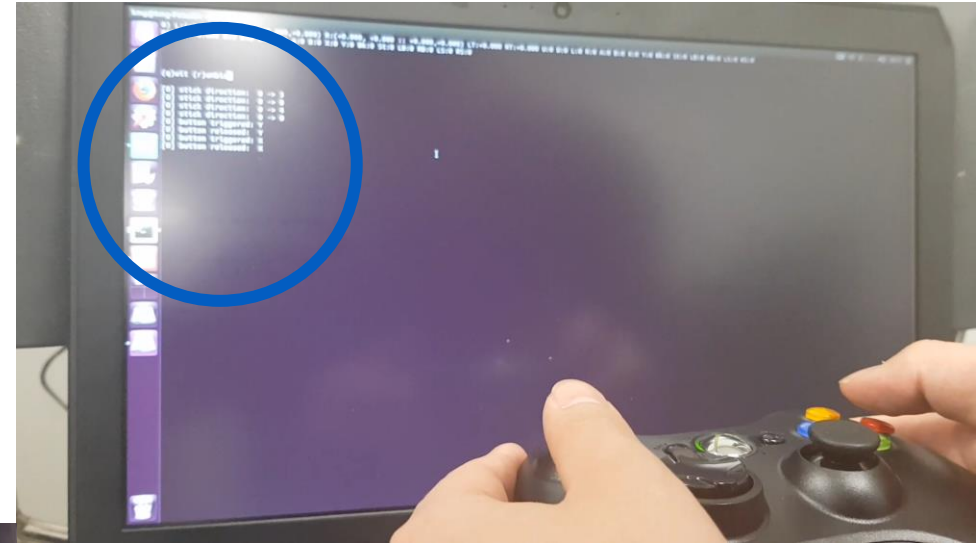
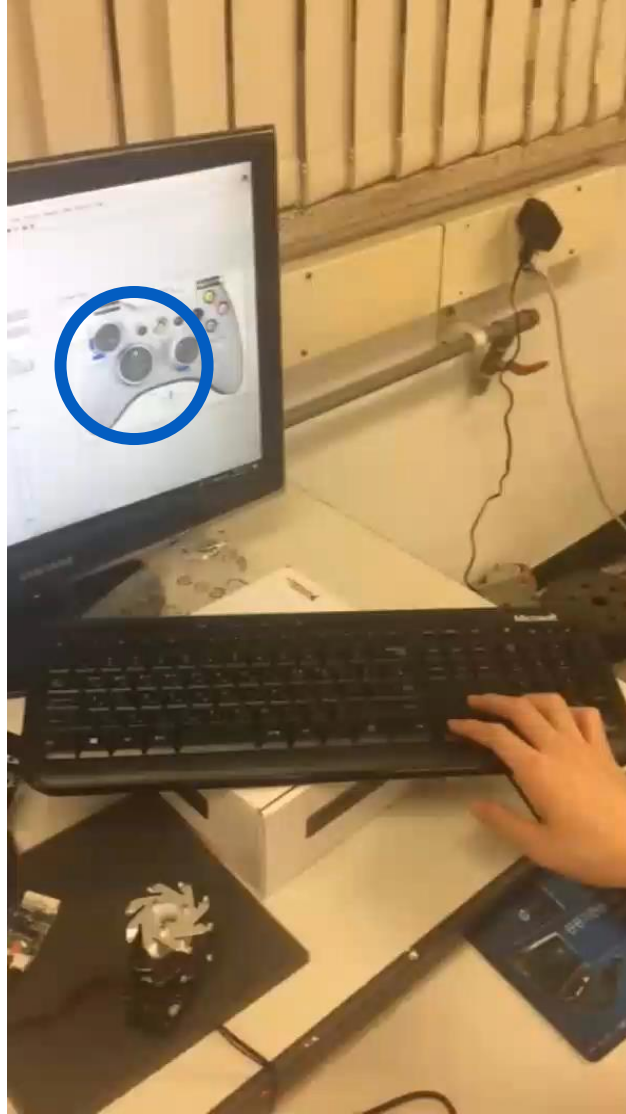
03. Solution System





03. Solution System Description

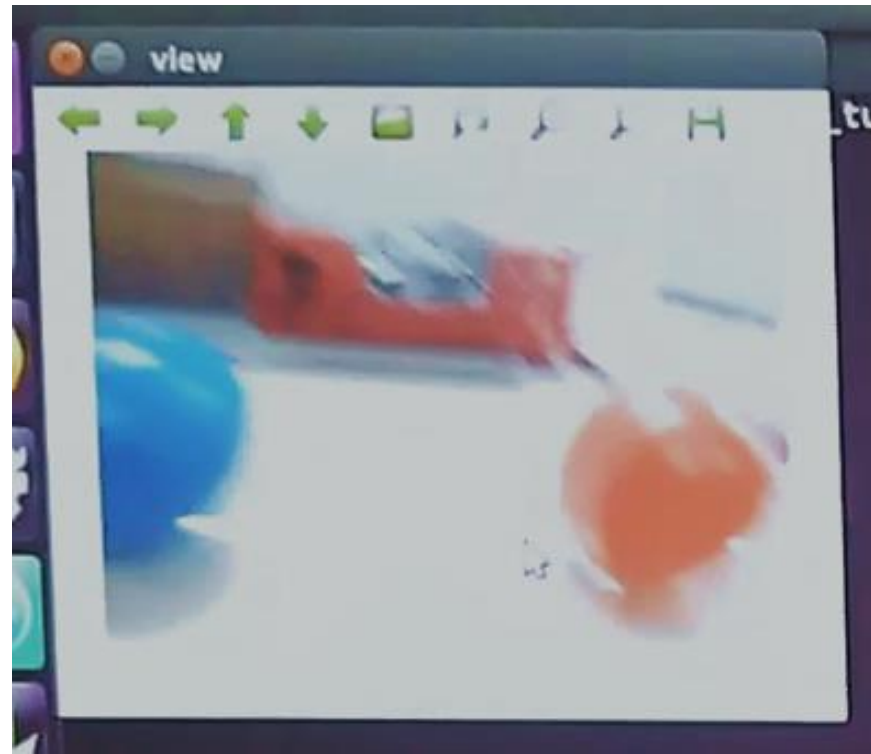
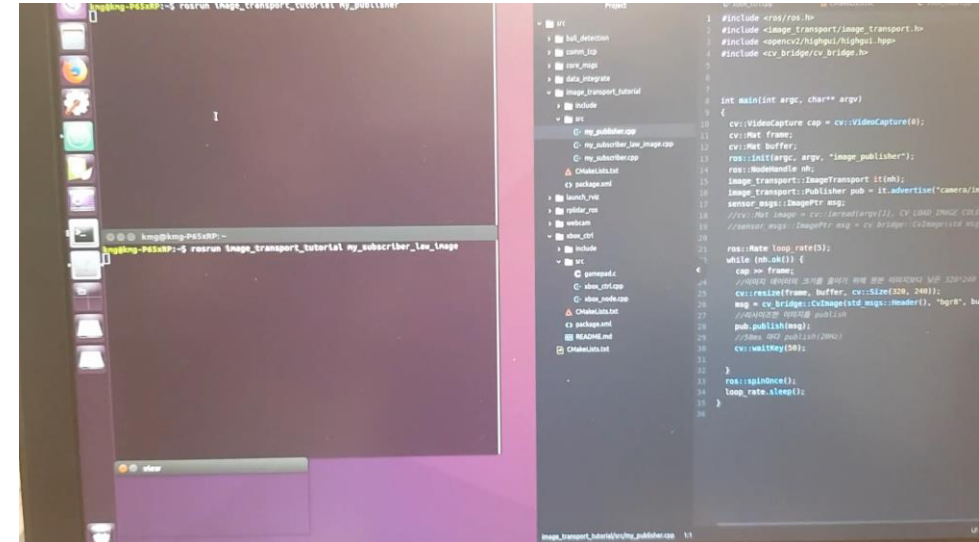
ROS_receive data



LabView_convert & send data

03.
Solution
System:
Control

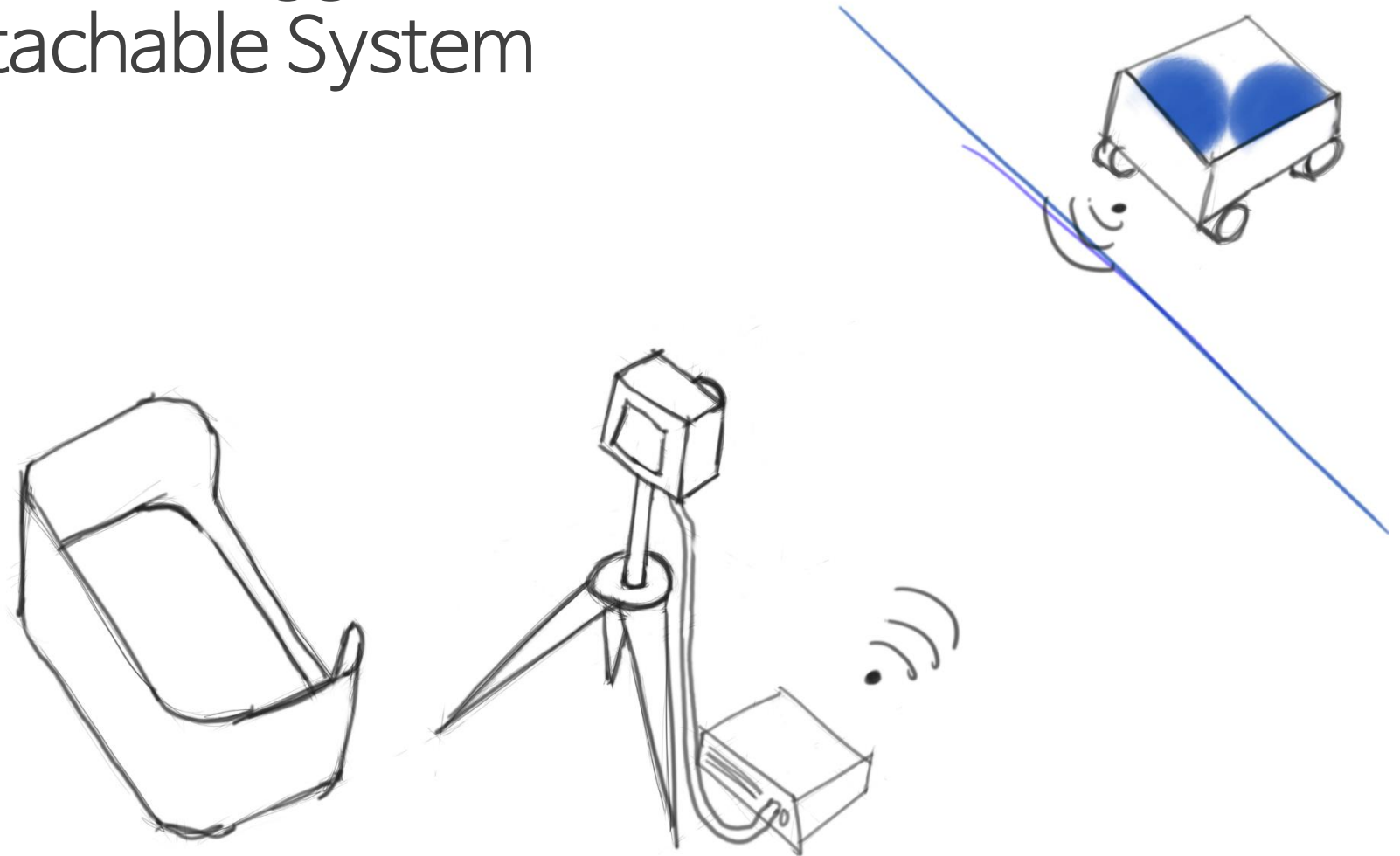
Vision input



03. Solution System: Vision & Vibration

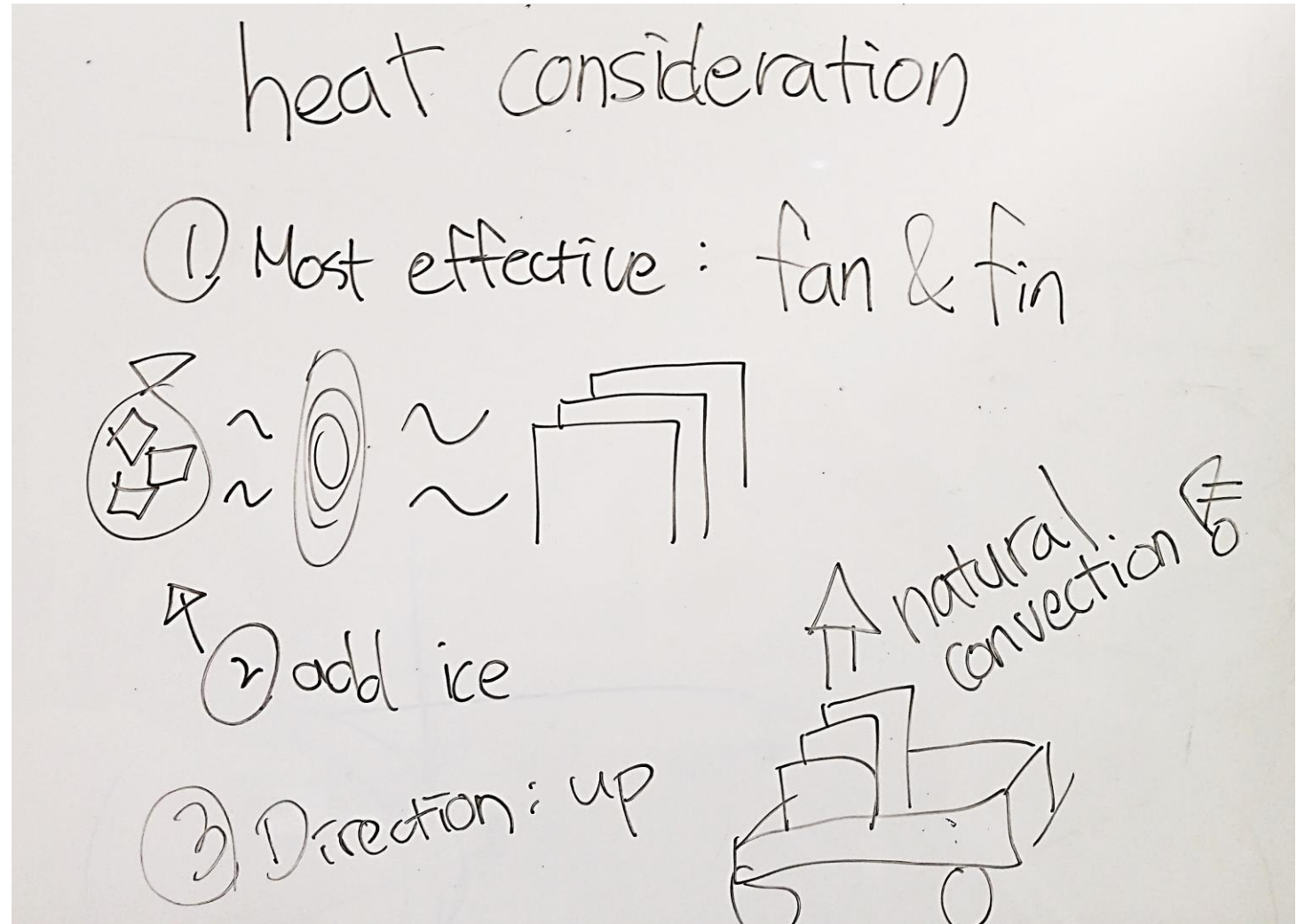
Main problem in vision:
Vibration

Solution Suggestion: Detachable System

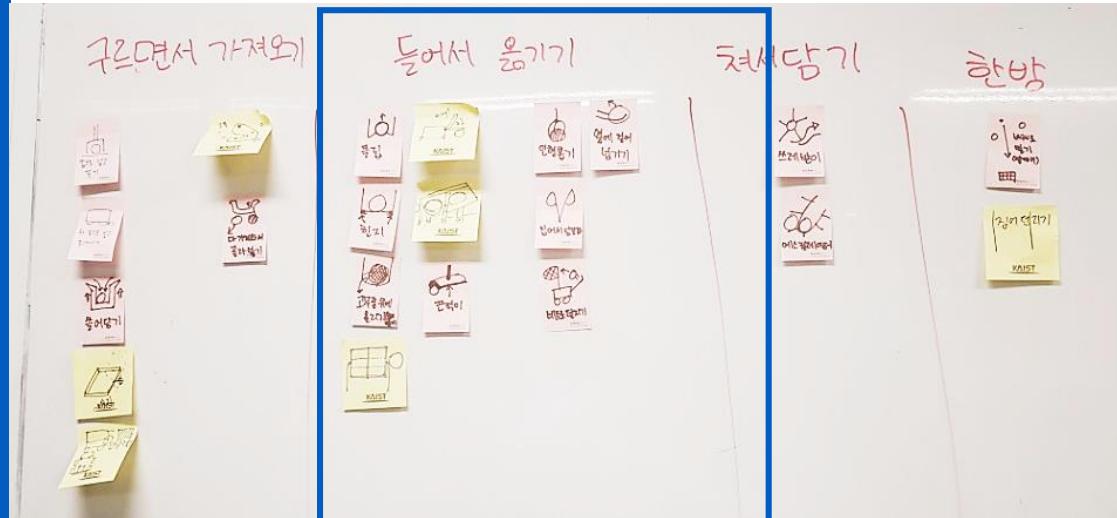


03.
Solution
System:
Vision &
Vibration

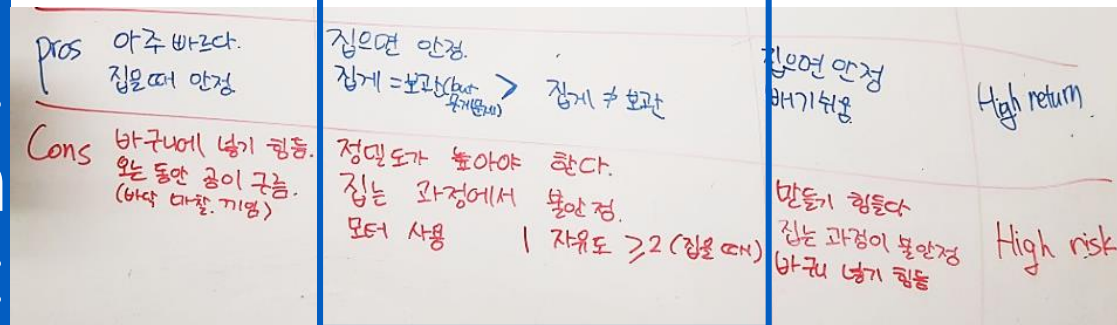
03. Solution System: Cooling



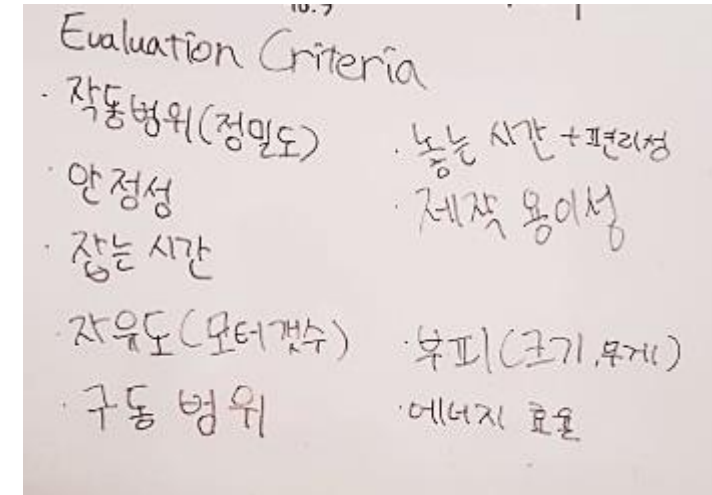
03. Solution System: Picking up



1. Idea brainstorming

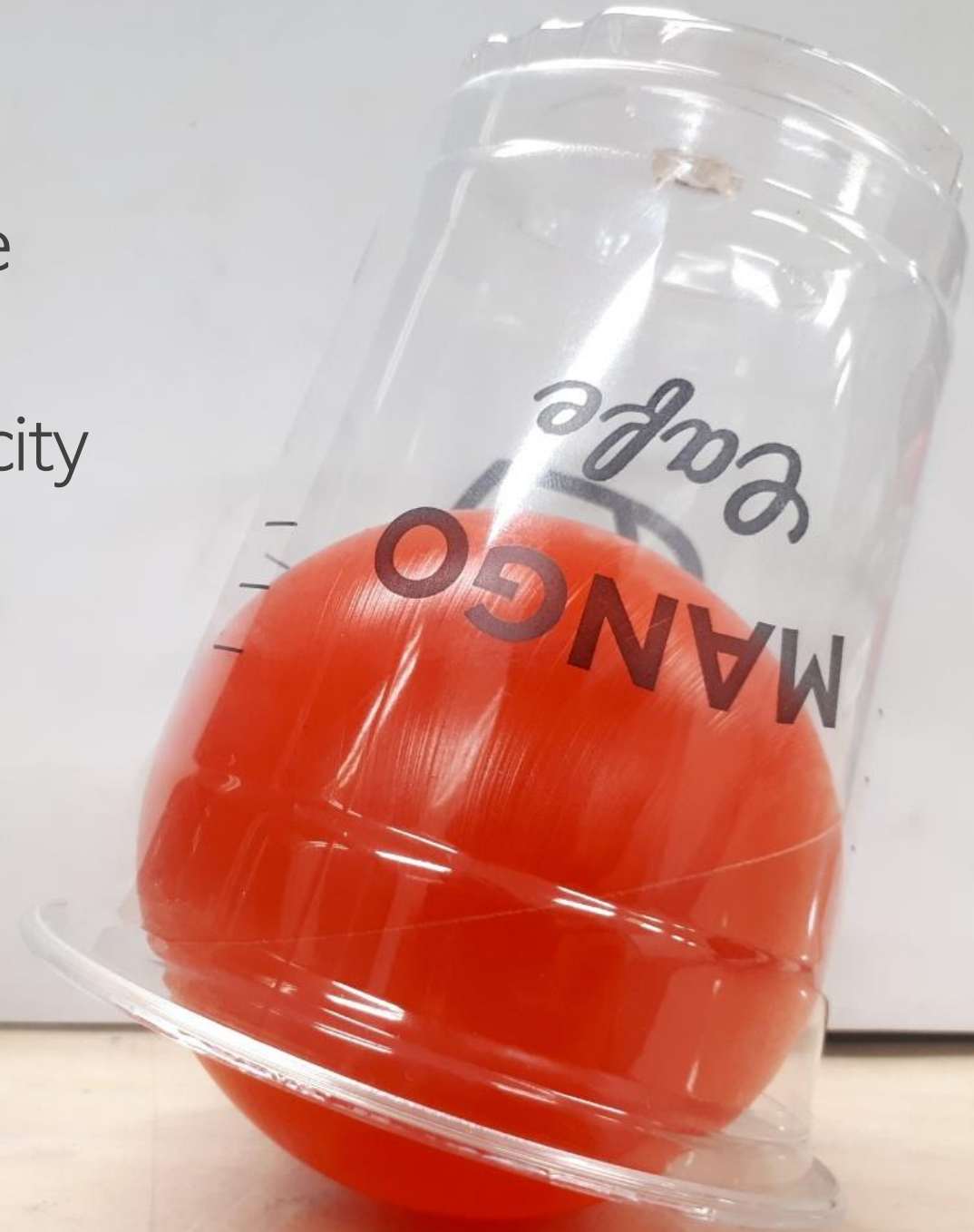


3. Idea evaluation



2. Evaluation criteria

Perfect Shape
Size
Elasticity



03.
Solution
System:
Picking up

03. Solution System: Picking up



+



03.13.~

↑ ↓ March 2018

Today Day Week Month Year ...

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
3/11	12	13	14	15	16	17
From today we are going to develop idea how to make motor and wheel running and make a						
18	19	20	21	22	23	24
2018 동계 패럴림픽 폐회 very rough, working prototype that we can test the controlling. The specific goals are designing a base that will support every part, designing basic links/joints, get the motor						
25	26	27	28	29	30	31
running using Lab view, and finally we will take a video to use in the						

Presentation!!!

04.01.~04.20.

For about 2~3 weeks, we will work on image processing and control.

+assembly of vehicle body, 1st prototype

04.20.~

Improving performance(time, recognition, control, heat, collecting method, etc, +VIBRATION)

04.
Expected
Time
Schedule

01.

Force Analysis_motor spec. and picker shape

02.

Ball → basket_how to put ball into the basket

03.

- Gear Reduction Ratio : 193 : 1
- Stall Torque : 2.3N.m (at 11.1V, 1.3A), 2.5N.m (at 12V, 1.4A), 3.1N.m (at 14.8V, 1.7A)
- No load speed : 54rpm (at 12V)
- Running Temperature : -5A ~ +80A
- Voltage : 9 ~ 16.8V (Recommended Voltage 12V)

Gearbox_20m / (15cm/s): more than 2 min

04.

Power Management System_two separate bodies

05.

Thoughts &
Comments

The image displays a variety of electronic components and their packaging, arranged on a light-colored wooden surface. The items include:

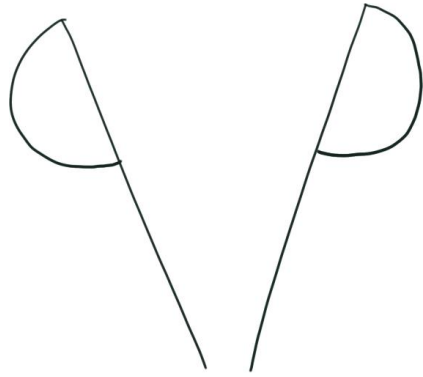
- Microsoft Xbox 360 Controller for Windows**: A black controller in its original red and black box.
- RPLIDAR**: A black sensor unit in a black box.
- Intel NUC Mini PC Kit NUC7i5DNKE**: A brown cardboard box for the Intel Next Unit of Computing Mini PC.
- Logitech 920r**: A black webcam in its black and green box.
- ipTIME A1000G**: A white USB device in its white box.
- ADATA 128GB SSD**: A blue and black box for a solid-state drive.
- Intel NUC Kit**: A white box with documentation, including a "Safety Information" sheet.
- Dynamixel Smart Actuator**: A white and black box for a robotic actuator.
- National Instruments myRIO**: A white box for a real-time control platform.
- Various sensors and actuators**: Several small components, including sensors and actuators, are shown in clear plastic bags, some with "ROBOTS" branding.

Appendix

Additional gripping mechanism

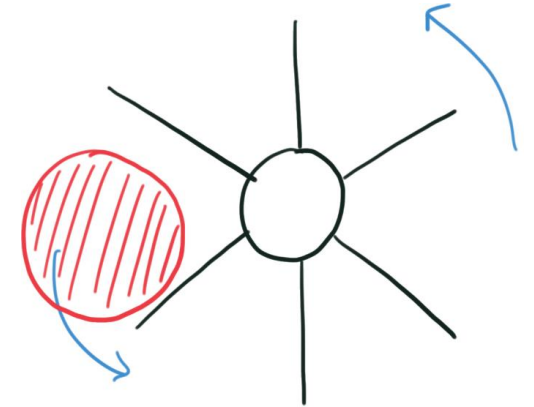


인형뽑기



잡고 뒤로 넘기기

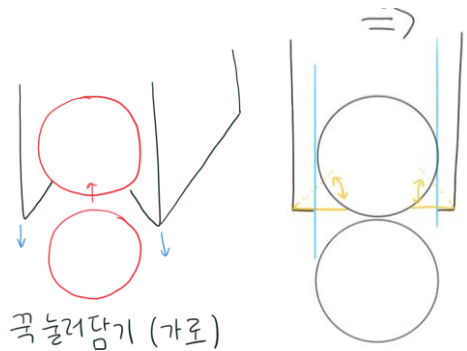
4. 에스프레소 머신



테니스공 collector

Appendix

Additional gripping mechanism



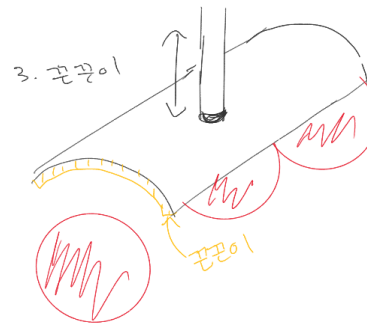
Narrow entrance

Variations:

clip, hinge, rubber band
vertical, horizontal

Advantage: stability &
accuracy

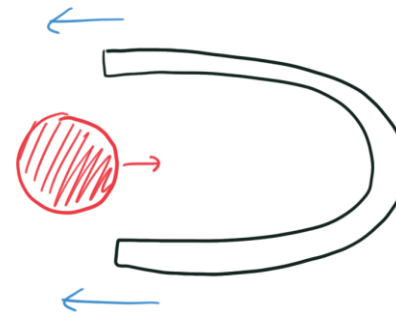
Disadvantage: precision &
rate of success



Sticky holder

Advantage: Picking letter

Disadvantage: rate of
success, stability, size



Dragging

Advantage: simple
implementation, intuitive,
unique body, rate of
success

Disadvantage: accuracy,
putting into basket

Appendix

Naver corporation demo video screenshot

