2025 Annual Activity Report

Tohoku UAV Tech

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Outline

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- 2025 Club Goals
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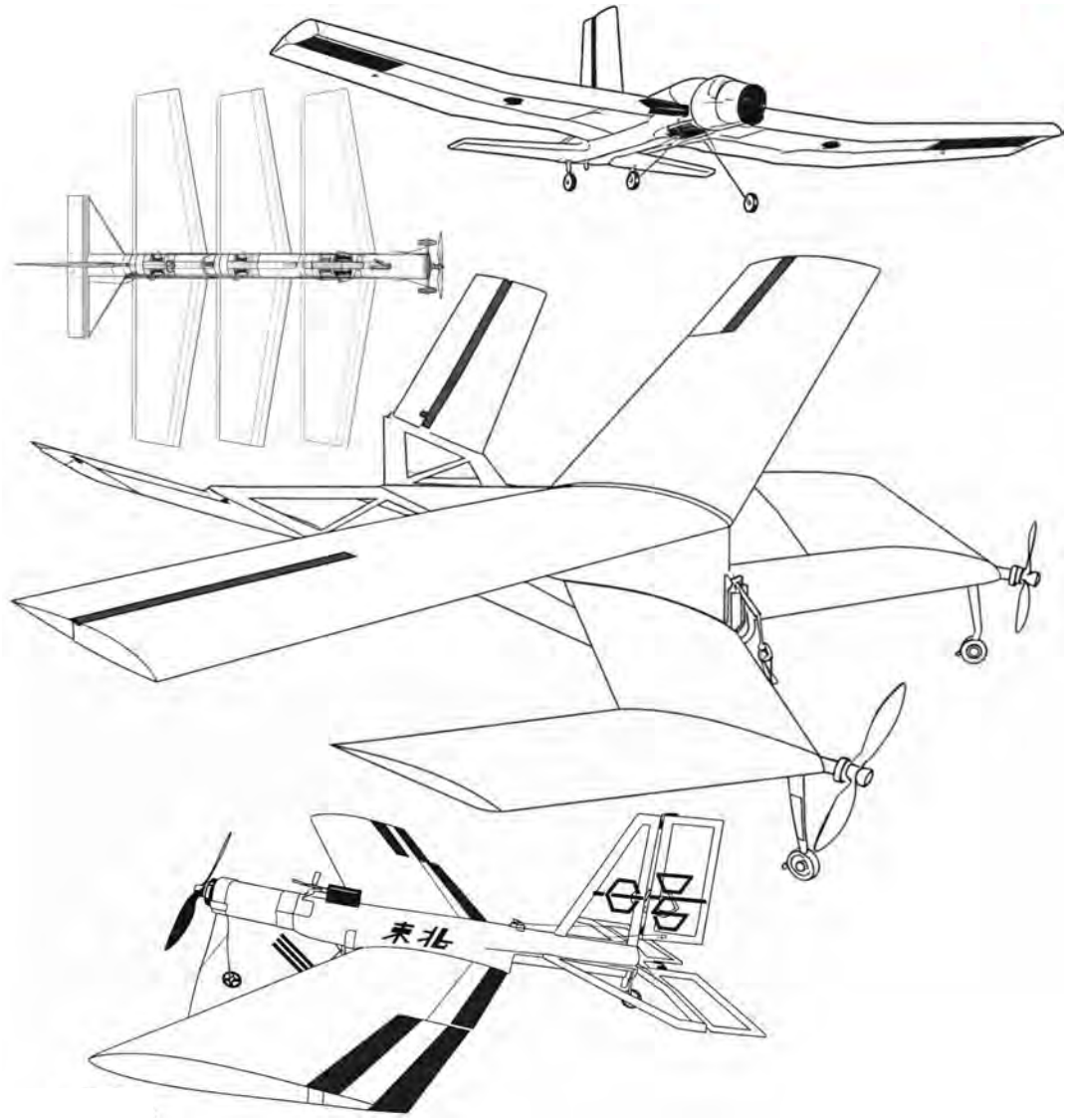
- Conclusion
- Next Year's Goals
- Acknowledgment



Activity Introduction

■Tohoku UAV Tech

✓Purpose of Our Activity

- ➢To make aircraft and win prize in the Japan Student Flying Robot Contest
- ➢To develop new method for making and controlling aircraft
- ➢To improve aeronautical engineering skills

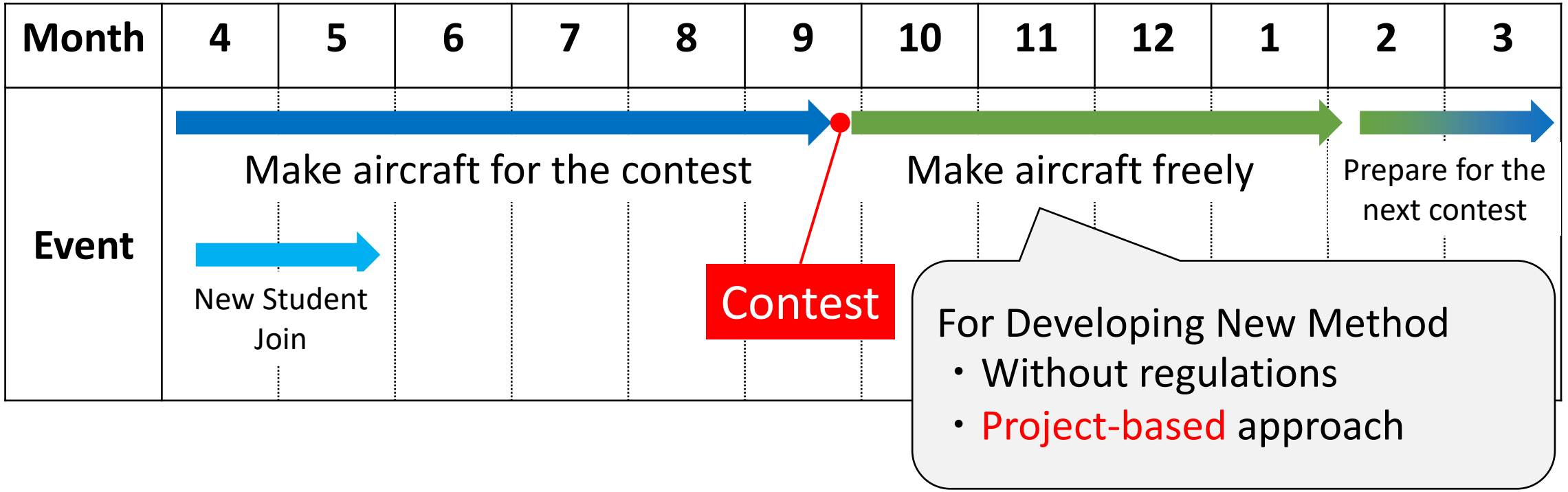
✓Members: 12

- ➢Sophomore ×7
- ➢Freshman ×5

Activity Details

■Tohoku UAV Tech

✓Yearly Schedule



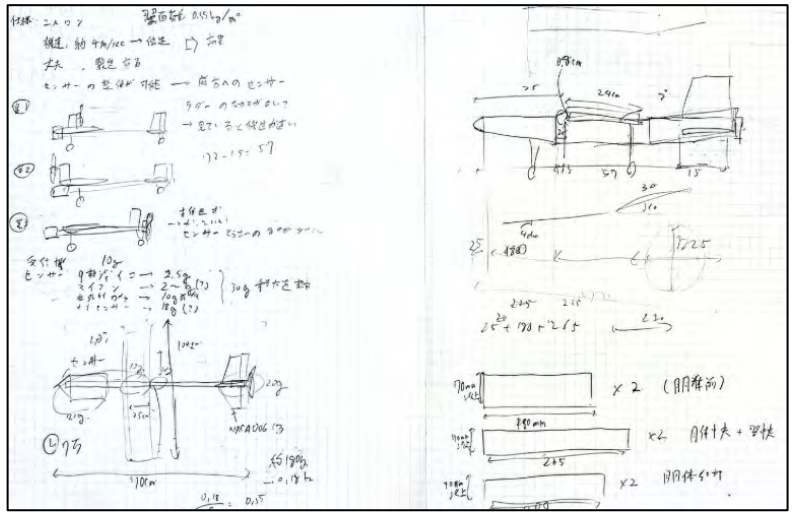
About Contest

■Japan Student Flying Robot Contest

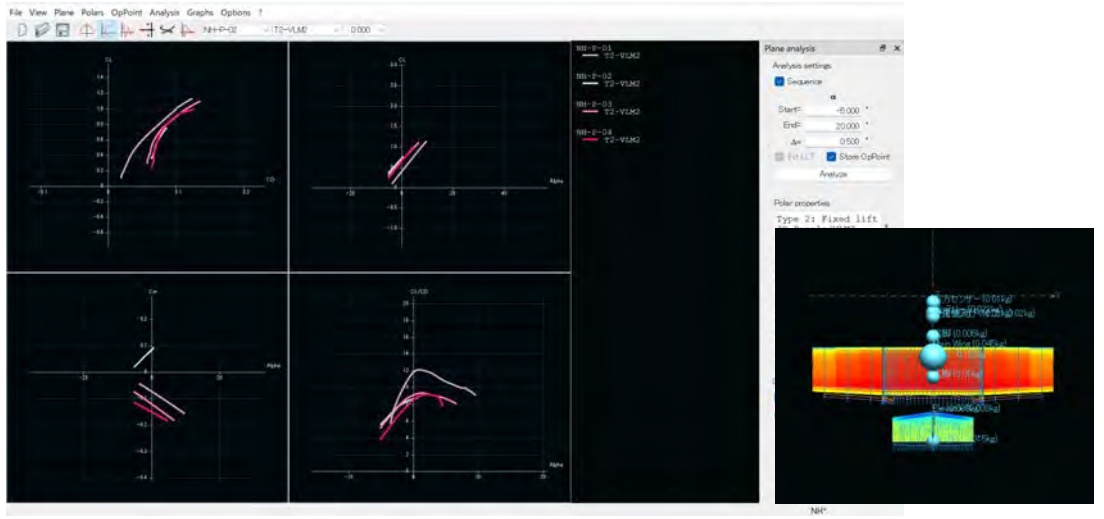
- ✓ Overview
  - ➢ Students come from all around Japan
  - ➢ Compete in teams
  - ➢ Team members make radio-controlled aircraft
- ✓ Separated to some sections
  - ➢ General : **Performance** and **Maneuverability**
  - ➢ Unique : **Originality**
  - ➢ Multi copter : **Performance** and **Maneuverability**
  - ➢ Auto operation : **Autopilot system**

How we develop our machine

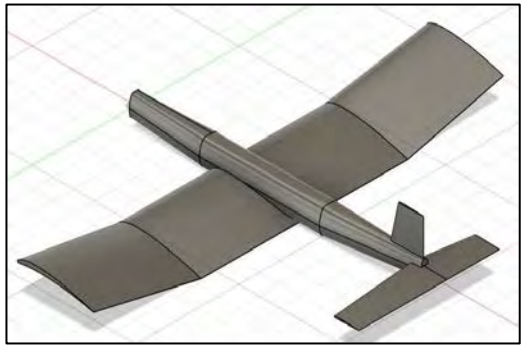
■Design

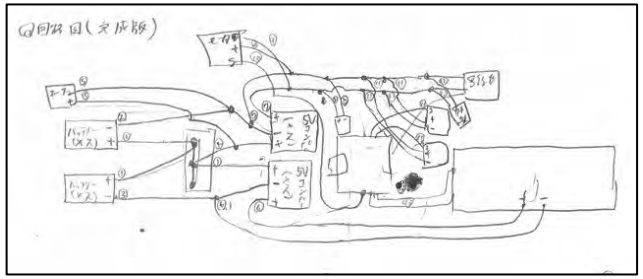


Concept Sketch



Analysis





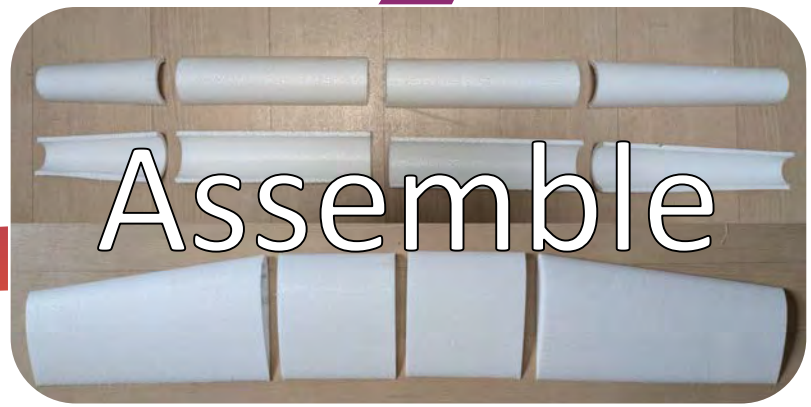
Electrical Systems and Overall Airframe Design

How we develop our machine

■Manufacturing

✓Based on Design

We repeat this cycle



2025 Club Goals

- Design unique aircraft
- Win more than 2 Prizes in the contest
- Make many kinds of aircraft continuously

Takuetu-1.1

■Concept

✓ High **gliding performance** and **Maneuverability**

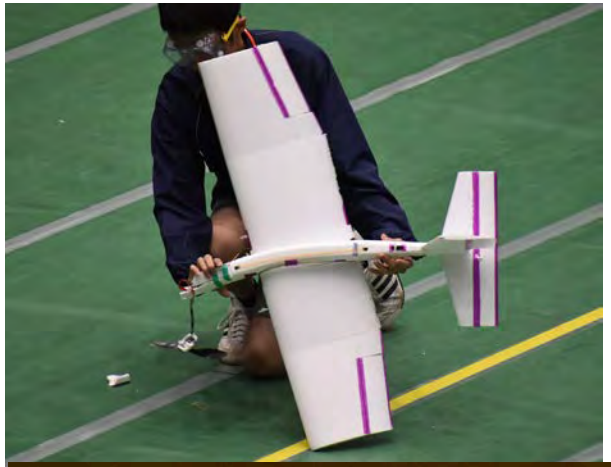
■Characteristic

Length	Span	Height	Weight	Wing area	Wing loading
780mm	995mm	355mm	**178**g	24dm^2	6.49g/m^2

✓ **Large wing** with custom designed air foil

✓ **Slender body** to decrease air resistance

✓ Counter-rotating propellers



Takuetu-1.1

■Result

- ✓Clash caused by equipment failure
- ✓The machine needed more toughness

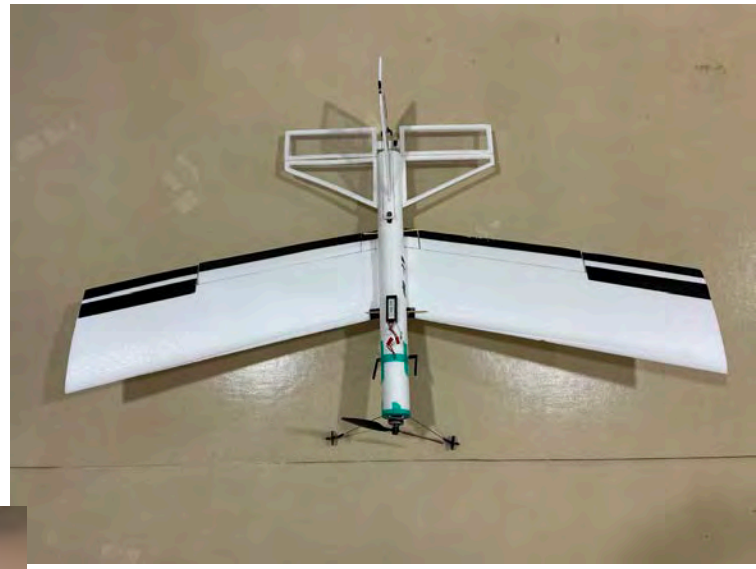
C-go

■ Concept

✓ High maneuverability in **slow speed** and Mechanism suitable for the mission

■ Characteristic

Length	Span	Height	Weight	Wing area	Wing loading
670mm	1200mm	330mm	193g	22dm^2	**8.77**g/m^2



✓ Gain lift by using **flaps**

✓ **Forward swept wing** and large **lightening holes** in tailplane

✓ One mechanism capable of both collection and release

■ Result

✓ Achieved high stability

✓ 5th place in the final tournament

Ɛï3ৎ(Butterfly effect)

■ Concept

✓ Win the contest with a **unique machine**

■ Characteristic

Length	Span	Height	Weight	Wing area	Wing loading
820mm	1100mm	220mm	195g	36dm^2	**5.42**g/m^2

✓ Yaw control by **varying the thrust** of the two motors

✓ **Another wing** in front of the main wing

✓ M-shaped wing and V-tail

✓ **High gliding performance**

■ Result

✓ **Received Best craft prize (SUBARU prize)**

Flapping-tan

■ Concept

✓ Machine with **flapping wings** and **Combine** motor and wing system

■ Characteristic

Length	Span	Height	Weight	Wing area	Wing loading
800mm	650mm	150mm	142g	18dm^2	7.89g/m^2

✓ **Multiple wings**

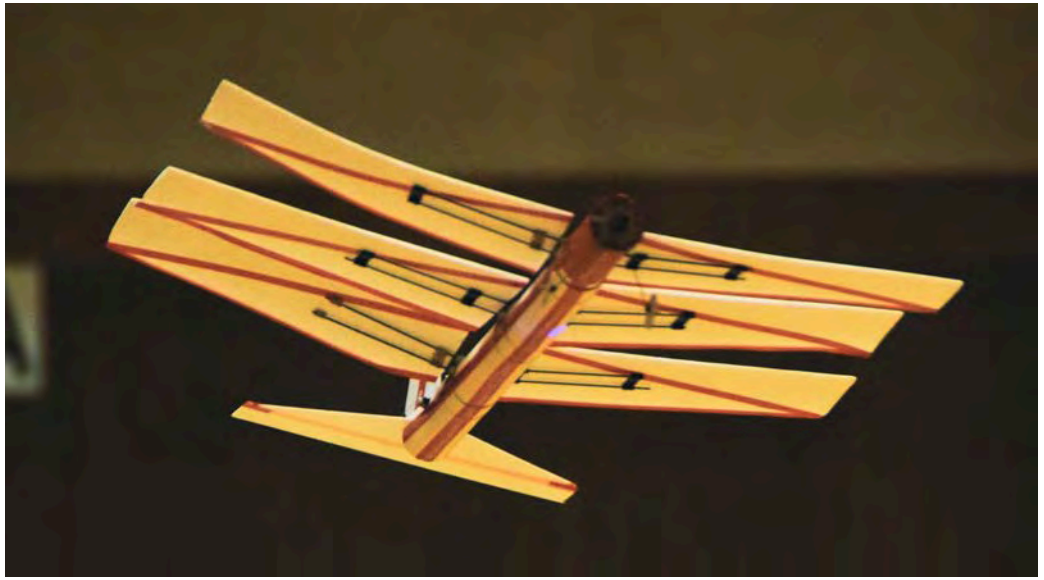
✓ 3 different modes (Flapping, Motor-driven, Hybrid)

✓ Unitized body

■ Result

✓ Machine that is easy to control

✓ **Received Boeing Prize**



Conclusion

■We managed to design many unique aircraft.

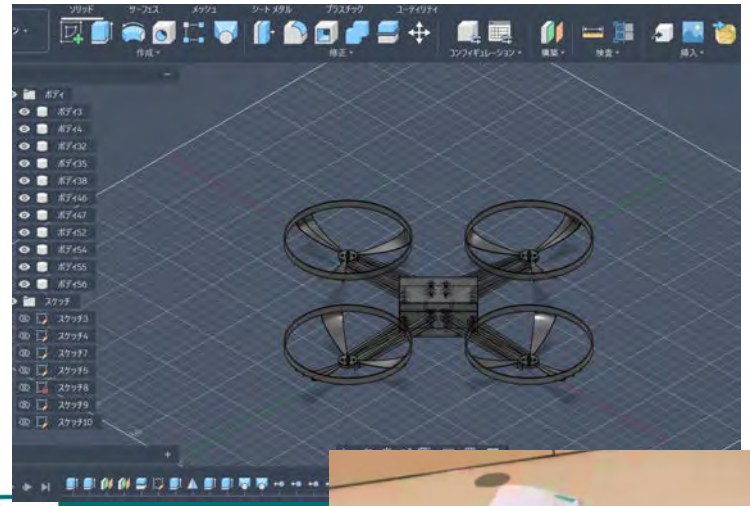
■We were able to receive 2 prizes in the contest.

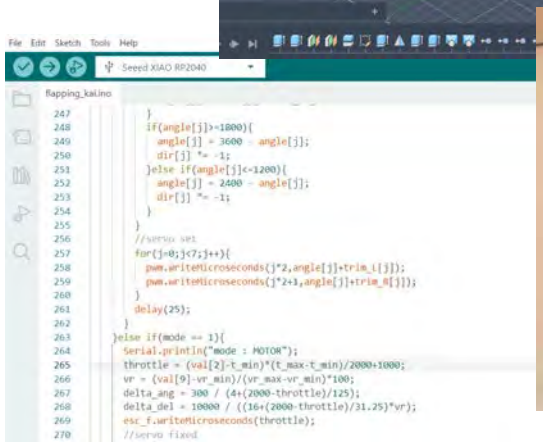
✓**SUBARU prize, Boeing Prize**

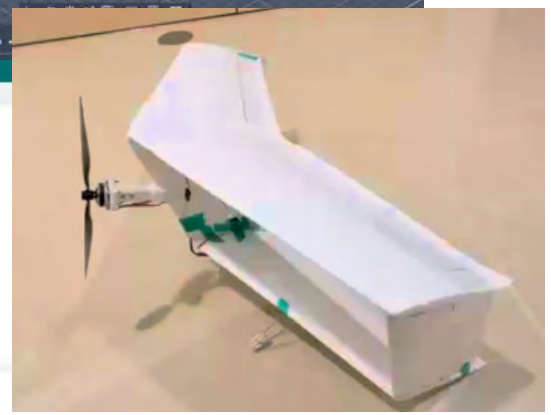
■We made 9 aircraft this year.

Next Year's Visions

- Aim for higher prizes
- Make more than 6 kinds of aircraft in a year
- Develop Multi Copters
  - ✓Establish drone manufacturing techniques
- Create Automatic Operation System
  - ✓Use 9-axis gyro sensor and camera
  - ✓Challenge the automatic landing







Acknowledgment

We were able to improve skills through rewarding activities.
We really appreciate supporting us.

Thank you for listening