Sky Ray Ⅱ

東海大のでかちゃれ DekaChalie

We challenge unique machine, “Canard wing” and “Mid-Prop”

Specifications

Height	: 225 mm
Length	: 940 mm
Wing span	: 1065 mm
Chord length (canard & main wing)	: 200 mm
Wing area	: 21.3 dm^2
Canard area	: 8.0 dm^2
Mass	: 195 g
Angle of attack	: 4°
Wing loading	: 9.15 g/dm^2
Center of gravity from canard	: 435 mm

Fig1:Sky Ray(2014)

Upgrade!

Fig.2 Sky Ray Ⅱ

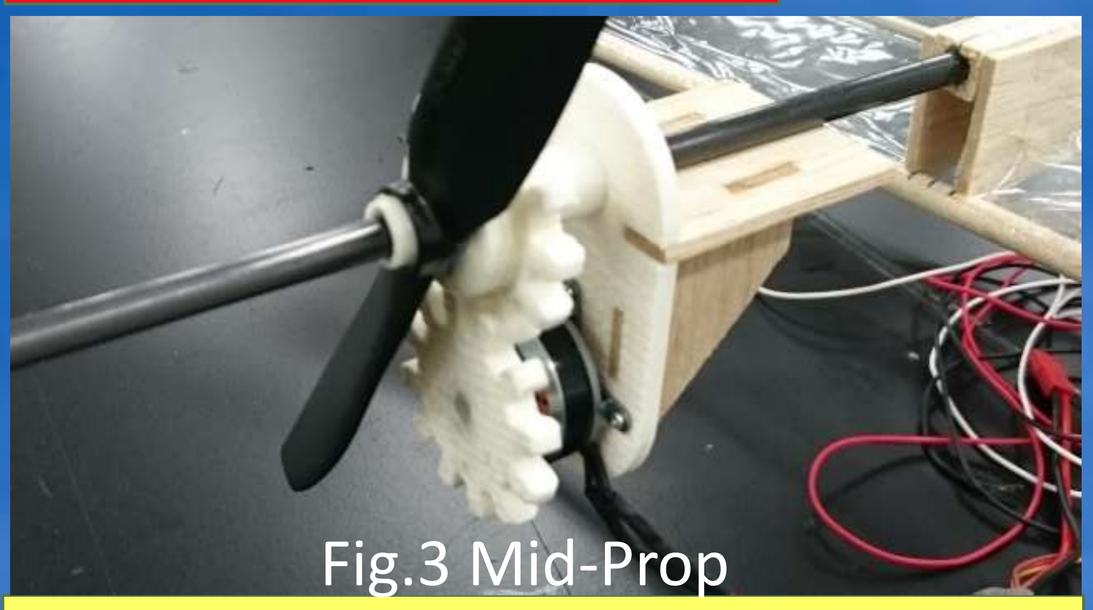


Fig.3 Mid-Prop

Driving gear system

As shown in the fig.3, we used two gears to shift the rotation to the propeller from motor axis. Mid-Prop was realized due to attach a gear to the motor and put the airframe pipe through center of another.

Advantage of “Mid-Prop”

1, Easy to set center of gravity .

It is necessary to set the C.G. at the middle point of airplane for Canard plane because each wing is lifting, Adjustment of C.G. becomes easier by putting the propeller and motor at the middle point of the plane.

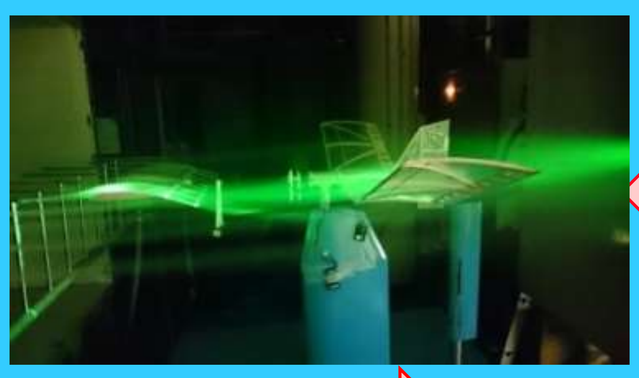
2, Increase of mobility

When the propeller is located at the middle, wake hits on the rudder well. As a result , It increases the mobility of yawing motion.

Safety

1. The propellers position is middle of the airplane. If this machine crash into people, people don’t have a pain.
2. We integrate the fuselage and propeller. Therefore , we don’t have to worry about the dropout accident of propeller .

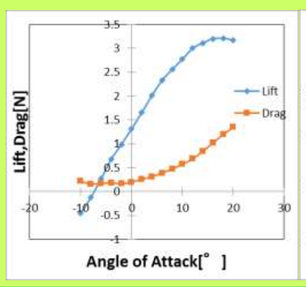
Wind-Tunnel Test

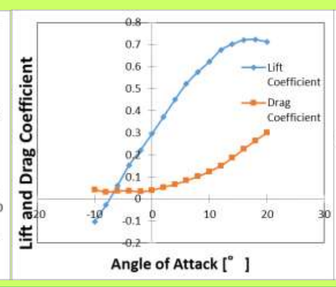


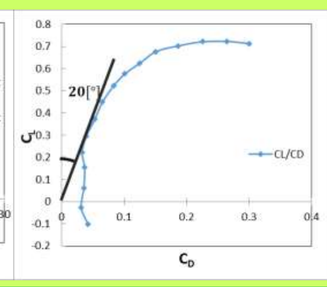
The flow doesn’t separate on the canard wing, and the wake of canard influences little to main wing.

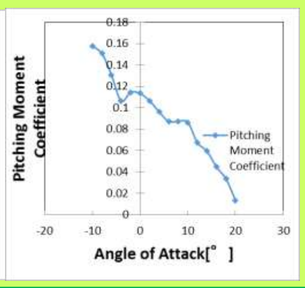
Since wing-tip vortex doesn’t flow into the disk surface of propeller, the efficiency of propeller doesn’t vary.

The results of Wind-Tunnel Test









From the above results

① The graph shows that stall angle is 18 degrees.

② The weight of airplane is 200g. When the angle of attack is 4 degrees, weight equals to generated lift.

③ The pitching moment coefficient is inclined right downward. Therefore , we can make sure that Characteristic of the static stability.

Tokai University Challenge Center Student Aircraft Project

Chloe O'Brian

Tottori University – UNIQUE

Concept

UFO

Spec

Wight : 198 [g]
Length : 840 [mm]
Span : 840 [mm]
Height : 250 [mm]
Wing Area : 0.51 [m^2]
Aspect Ratio : 1.51
Materials
: EPP, carbon pipe, film, carbon sheet, etc.

Original Mission

- throwing hand
- Drop crews
- carry off people(suika nyan, USA pyon)

Features

・circular wing & V-tail
The simple shape recall UFO !
We used software HLGw to calculate this dihedral.

・motor
Pusher & In the Body.
It makes her safety and durable.

・3D Printer
motor mount & connecter of wings.

YS-II

National Institute of Technology, Akita Collage

Member

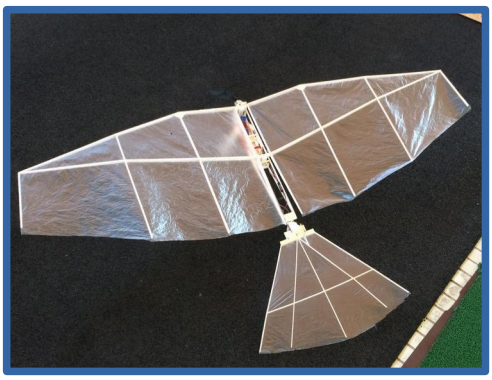
Kazuki Yoshida
Daiki Igarashi
Ryo Saito
Risa Iwata
Yuuki Kon

Adviser

Yoshinori Konda
Masamitsu Wakoh

Concepts

No rudder
Small resistance
Easy to carry

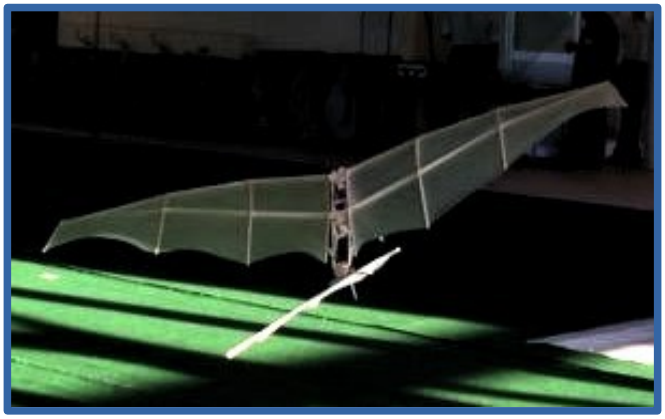


Design

The aircraft looks like a bird. It has no rudder, so it achieved low resistance and high efficiency. The flight is silent because of turning the nine inches propeller at low speed. In addition, it is slow consumption of battery.

Production

1. Making frames
2. Pasting film on frames
3. Assemble
4. Flight



Safety

Body made by soft balsa
Putted propeller's guard

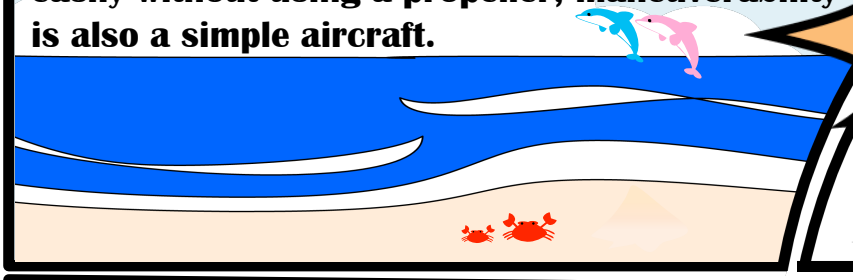
STR ~STRange Robot~

Teikyo University Kawamura Laboratory
Souki Saito, Ko Uzuki, Mayuri Sakamoto, Riho Takumi, Aki Matsumoto

No time No people…..No anything

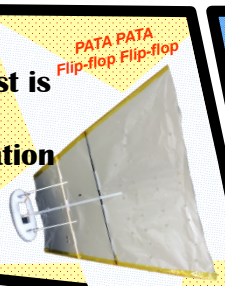
Concept

STR is a robot that was the that unusual movement and form. By the airship type, it can be promoted by a small power. It is possible to fly easily without using a propeller, maneuverability is also a simple aircraft.



Trust mechanism

- By moving side to side, the thrust is generated
- Pivoting by performing an operation in one direction.



Center of gravity mechanism

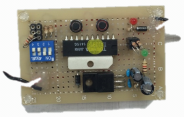
- Position of the center of gravity is changed by the fact that weight is moved around the airship.
- It can be three-dimensional works by the center of gravity moves.

Mission

Mission in this aircraft performs an operation that can not be normal by the three-dimensional movement and wheel dive.

BOMB

Micro computer



It does reverse rotation and the servo control of the motor

Specification

Length	10000	mm
Width	500	mm
Height	600	mm
Weight	200	g
Volume	220	m^3

The Sari discarded the notion of propeller and wings needed for flight, it tought the idea overwhelm the other aircraft. Please look forward to the flight of a production.

Jetliner

Tokyo University of Agriculture and Technology

Concept : Reproducing a passenger plane Boeing 737 MAX as possible as we can.

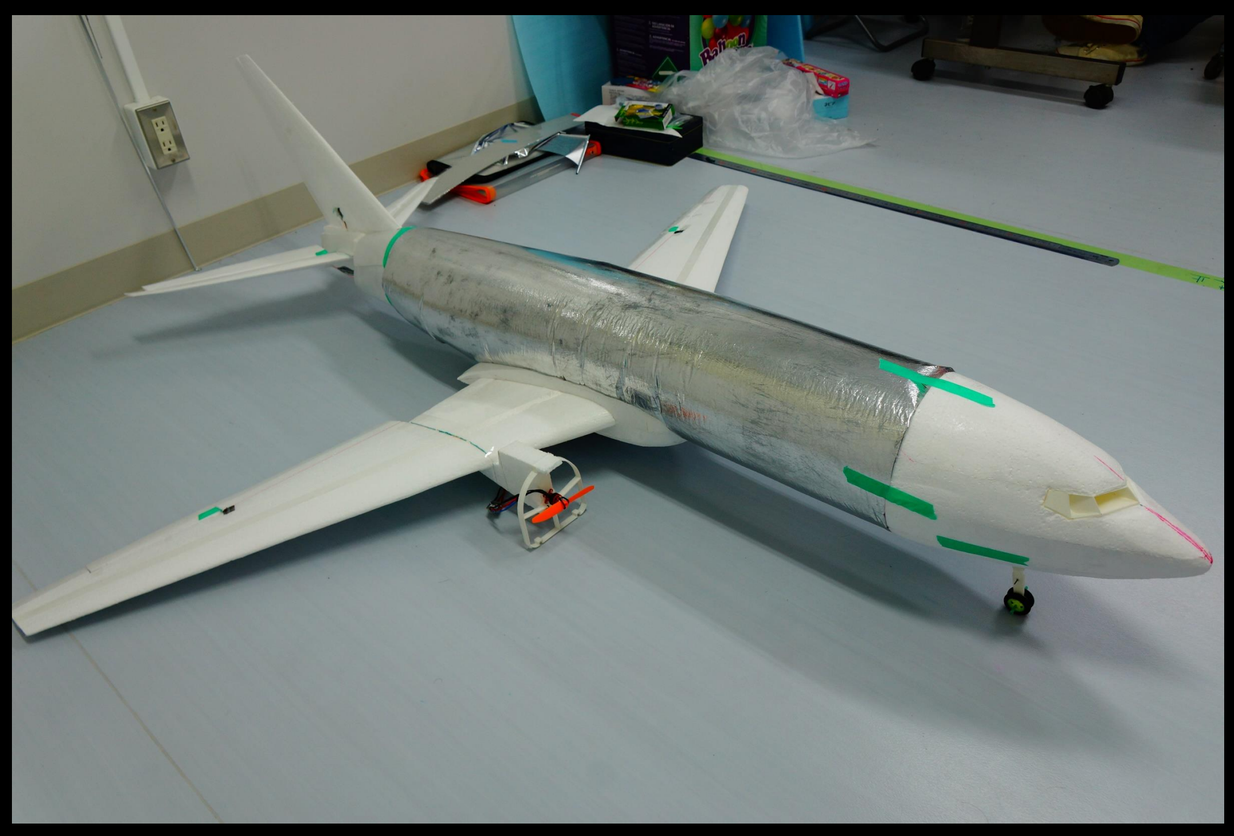
Feature : All landing gears are able to retract while flying. A big balloon at the body part. The biggest plane of all plane entered this contest.

Design : The whole body was designed by using 3D-CAD.

Manufacturing : All wings are made of polystyrene. The fuselage is made of a big balloon filled with helium gas and it enables to lose weight.

Safe : The shape of Jetliner is not sharp. Therefore Jetliner is safe even if it hits something.

Specification	
Length	1.7m
Span	1.6m
Empty weight	420g
Wing area	0.14㎡
Wing load	3000g/㎡



Attention!
This picture is a version under developing.
You may see the perfect version at the contest.

HOTARU

Dept. of Aerospace Eng
CST Nihon Univ.

Member

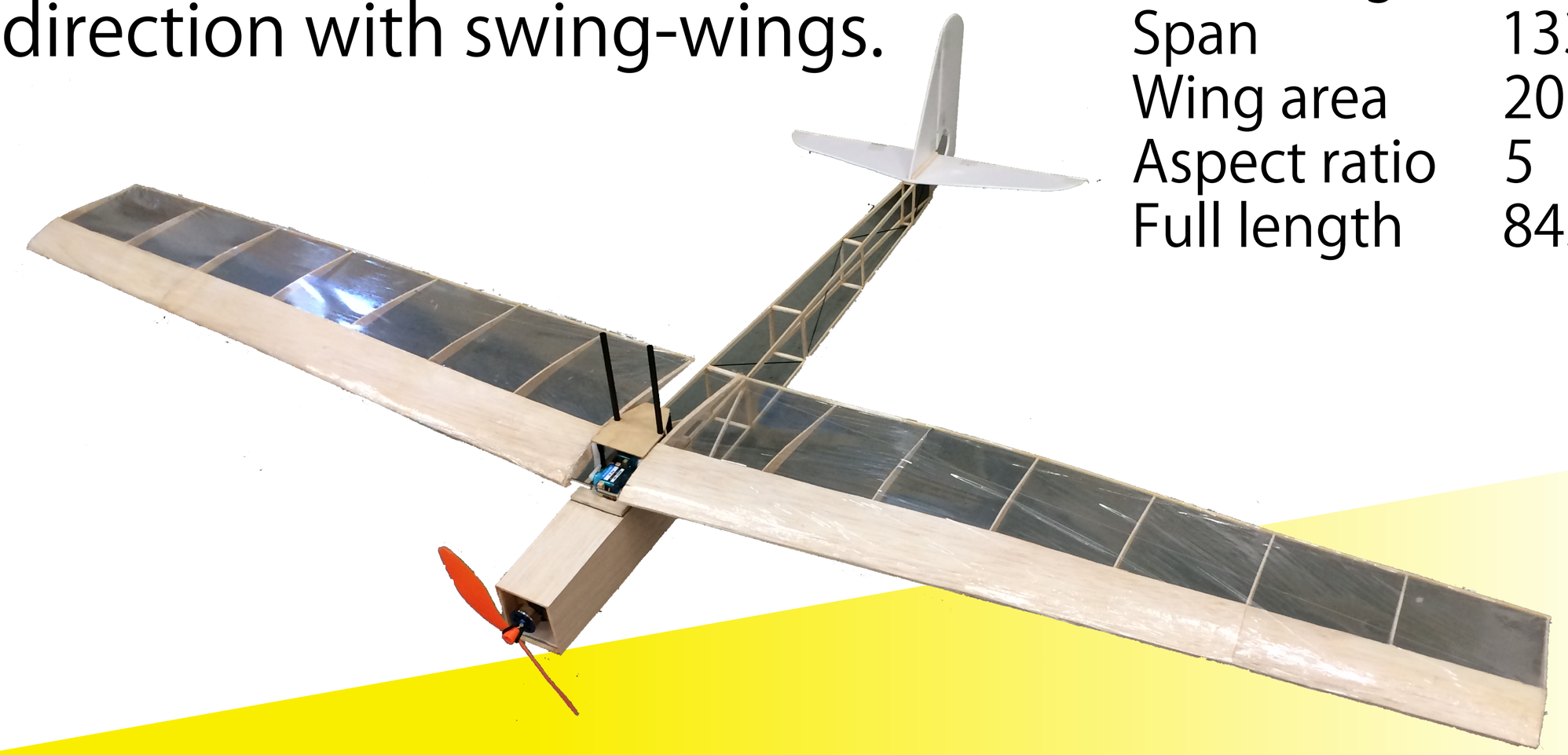
Yamaguchi Keitarou
Yanase Masaru
Matsuo Rion
Yoshimura Keisuke

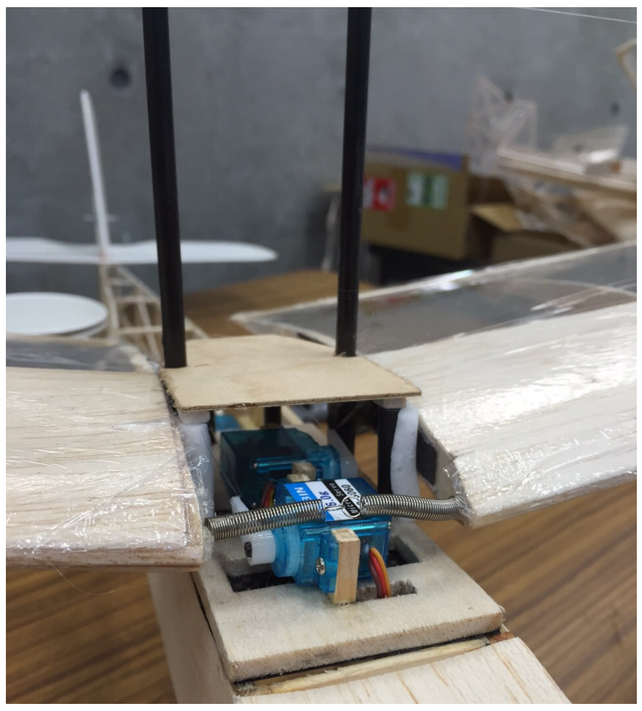
CONCEPT

Operation of the roll direction with swing-wings.

Spec

Total weight	190g
Span	1335mm
Wing area	20.4dm^2
Aspect ratio	5
Full length	845mm





Body	Balsa,carbon and hinoki
Main Wing	Balsa and hinoki
Wing Section	Göttingen 269

Mechanism Design

Swing-wings system is composed of two cabon pipes as the fulcrum , two servos , two springs and etc . This system assists motion in roll direction.

move!

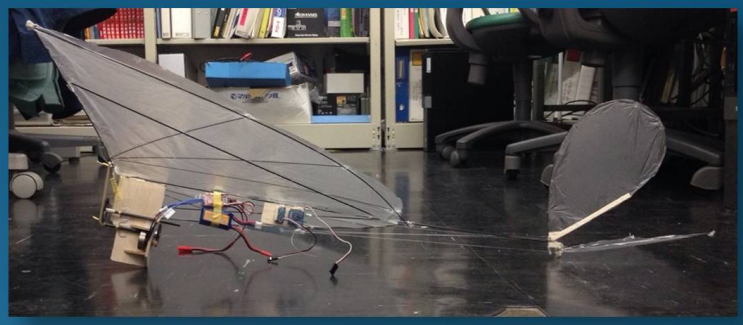
movie

キャタピー　Lv99

The Evolution from a "caterpillar" to a "butterfly"

Concept

flying only with wings



light

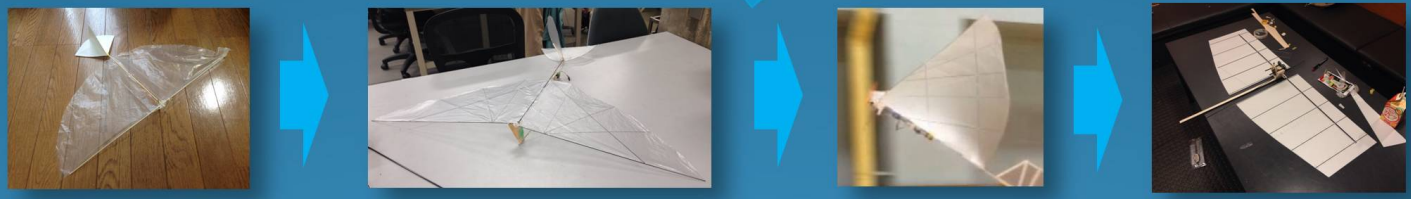
① rigid frame
② soft wing
③ powerful motor
④ strong gearbox

Fabrication

① rigid frame → •CFRP pipe (Φ0.8～Φ1.5)
•Instant glue with tissue

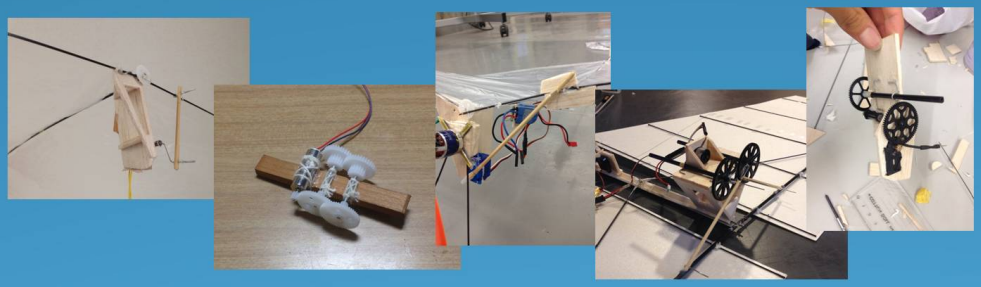
② soft wing → •Plastic bag (0.015mm)

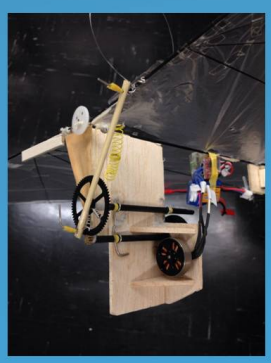
Back to aircraft No.1



③ powerful motor → •Motor for 2 cells battery

④ strong gearbox → •Handmade gearbox





Safety

•Very light
•Very slow
•No propeller

→ No damage when collided

Stories behind

This team was born in Waseda University on July 30, 2015. Four students from Sato Laboratory and one from WASA gathered to create a super amazing aircraft --- a robot that flies only with its wings! However, the process of developing a flapping robot was very hard. In addition, we did not have enough time to develop this robot, because the members were busy with other works. Though we are not perfectly prepared for the contest, please have a look at our unique performance in the contest!

Team Members
Atsuhiro Furuichi
Atsuki Moriya
Louis Toyonaga
Masahito Watanabe
You Iwasaki