

# 田中 博人 研究室 Aero/Aqua Biomimetics Lab



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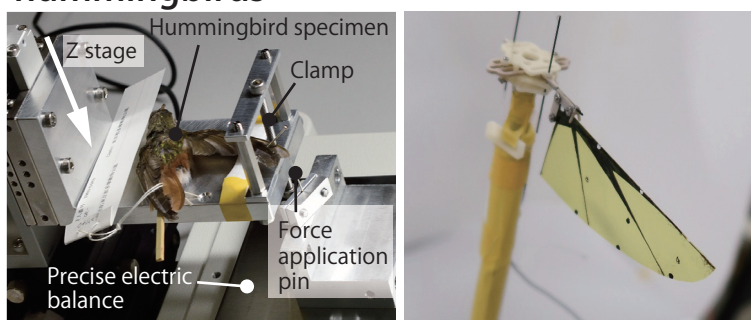
## Research direction

We study biomechanics and fluid dynamics of flying / swimming animals such as **hummingbirds** and **penguins** aiming to create biomimetic small, agile, and safe aerial / aquatic robots. We also focus on **biological micro structures** for biomimetic components. Through these studies, we innovate biomimetic mechanisms possessing biological softness and micro structures.

Interests in **biology, fluid dynamics, and micro fabrication** are highly encouraged!

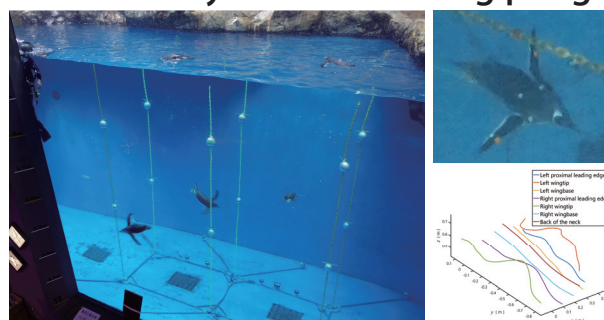
## Ongoing researches

### Flapping-wing aerial robots mimicking hummingbirds



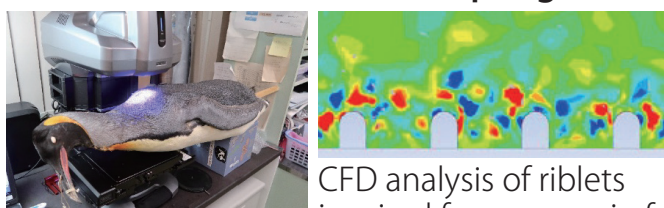
- Measurement of flexural stiffness of a specimen.
- At-scale elastic wing and mechanical flapper.

### Motion analysis of swimming penguins



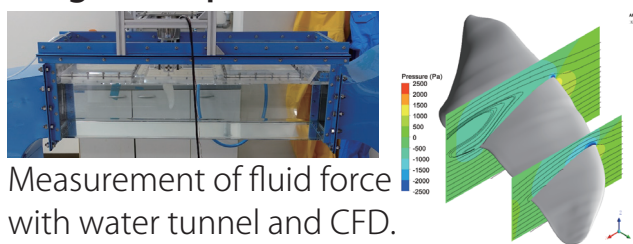
- Video recording with multiple water proof cameras at an aquarium.
- 3-D motion analysis of the wings and body.

### Micro surface structures of penguins



CFD analysis of riblets inspired from penguin feathers.

### Penguin-inspired underwater robots



Measurement of fluid force with water tunnel and CFD.

Collaborators : Yamashina Institute for Ornithology, Chiba University, National Institute of Polar Research

## Bachelor thesis themes in 2019 (tentative)

- "Development of elastic and tough flapping wings mimicking hummingbirds,"
- "Hydrodynamic study on elastic deformation of penguins' flippers," etc.

## Lab environment and available skills

Student office and experiment rooms : I3 - 404 • 104 (Shared with Yamaura lab) ,  
I3 - 101 (Shared with the school)

Available skills : Motion analysis, Micro NC machining, UV laser machining,  
Fluid dynamic experiments, PIV measurement, ANSYS Fluent, etc.