

田中 博人 研究室 Aero/Aqua Biomimetics Lab



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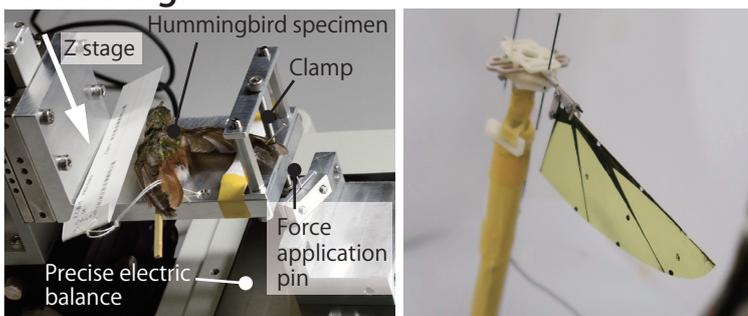
Research direction

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!

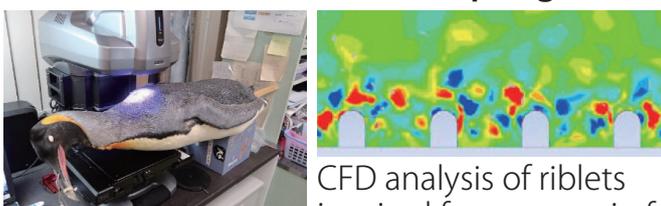
Ongoing researches

Flapping-wing aerial robots mimicking hummingbirds



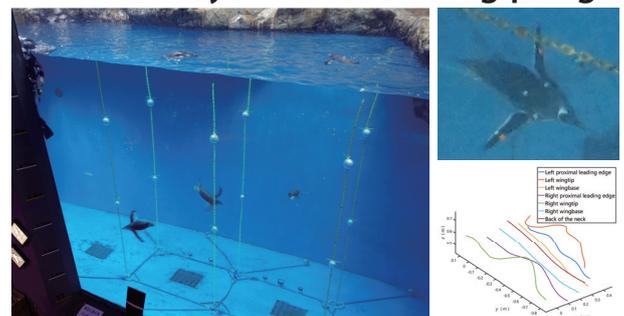
- Measurement of flexural stiffness of a specimen.
- At-scale artificial wing and mechanical flapper.

Micro surface structures of penguins



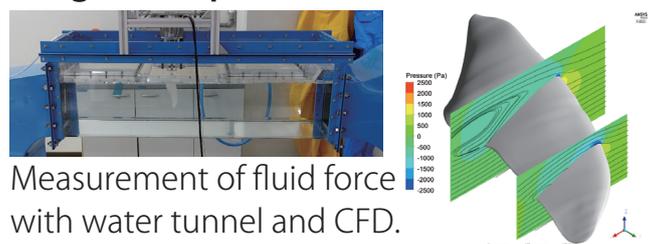
CFD analysis of riblets inspired from penguin feathers.

Motion analysis of swimming penguins



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

Penguin-inspired underwater robots



Measurement of fluid force with water tunnel and CFD.

Collaborators : Dr. T. Yamasaki (Yamashina Institute for Ornithology),
Dr. G. Shinohara (National Museum of Nature and Science)

Bachelor thesis themes in 2018 (tentative)

- “Development of on-board motion measurement system for penguins,”
- “Development of flapping-wing aerial robots mimicking hummingbirds,” etc.

Environment and available skills

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

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