Jasmin CM Wong

#3309 - 6270 University Blvd.
Department of Zoology
University of British Columbia
Vancouver, BC V6T 1Z4

e-mail: jwong@zoology.ubc.ca
phone: +1 (778) 798-7222

Education

University of British Columbia
Ph.D. Candidate, Zoology, 2016-Present
PI: Prof. Douglas Altshuler
Fields: Aeroelastic Flutter, Wing Morphing, Dynamic Structures
Dissertation: Mechanisms of aerostructural modulation during avian wing morphing

Hong Kong University of Science and Technology
M.Phil., Bioengineering, 2014-2016.
PI: Prof. Wenjing Ye, Prof. Hao Liu *(Chiba University)*
Fields: Multi-Scale Computational Fluid Dynamics, Blood Transport
Dissertation: The effect of endothelial cell morphology on wall shear stress during blood transport

McGill University
B.Sc., Physiology, 2009-2013.
PI: Prof. Luc Mongeau
Fields: Tissue Engineering, Mechanobiology

Research Experience

Biological Materials and Structures
Altshuler Lab, Department of Zoology, UBC

- Performed arterial cannulation to explore the effect of drug-induced smooth muscle activation on wing stiffness in anesthetised birds.
- Measured the effect of wing morphing on local stiffness and damping of in-situ wing feathers using an Instron electromechanical system, a servo-motor, and strain gauges in specimens and anesthetised birds.
- Measured changes in wing surface oscillatory displacement using a laser scanning vibrometer.

Mongeau Research Group, Department of Mechanical Engineering, McGill

- Evaluated the effectiveness of a tissue repair biomaterial after surgical scarring of a rat larynx using immunohistochemistry and imaging to quantify collagen.

Computational Modelling of Fluid-Solid Interactions
Altshuler Lab, Department of Zoology, UBC

- Analysed the effect of dynamically varying wing stiffness on flow patterns and aerodynamic performance using a fluid-structure model.
- Analysed the effect of feather shapes within and between species on aerodynamic performance using geometric morphometrics and XFLR5.
- Used photogrammetry to build 3D models of feathers.

Department of Bioengieering, HKUST

- Developed an algorithm to implement the effect of micro-scale morphologies on macro-scale fluid flow with minimal computational cost.
- Built 3D models from multi-camera images or CT scans.

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Teaching Experience

Teaching Assistant

Department of Zoology, UBC

- Wrote and graded weekly quizzes for an undergraduate level animal locomotion class.
- Graded exams for an undergraduate level animal locomotion class an a zoological physics class.
- Organised a biomechanics research Q&A for undergraduate students.
- Moderated a discussion board for assignment, course material, and related content.

Department of Bioengieering, HKUST

- Prepared course syllabus documents and ran a bioengineering seminar with motivated student participation.

Private Work

- Tutored high school mathematics, often exploring different ways to understand difficult concepts.

Mentorship

Altshuler Lab, Department of Zoology, UBC

- Taught an undergraduate volunteer anaesthesia techniques and introduced surgical techniques due to their interest in a medical career.

Mongeau Research Group, Department of Mechanical Engineering, McGill

- Trained a new graduate student in the required immunohistological techniques for their doctoral project.

Publications

Liu, H., Liang, F., **Wong, J.**, Fujiwara, T., Ye, W., Tsubota, K., Sugawara, M. (2015). Multi-scale modeling of hemodynamics in the cardiovascular system. Acta Mech. Sin. 31(4):446-464. doi: 10.1007/s10409-015-0416-7

(in progress) **Wong, JCM.**, Cao, Y., Fujiwara, T., Li, Q., Liu. H., Ye, W. The effect of endothelial cells on wall shear stress during blood transport.

(in review) Harvey, C., Baliga, VB., **Wong, JCM.**, Altshuler, DL., Inman, DJ. Birds can transition between stable and unstable states via wing morphing. Nature.

Conferences

Wong, JCM., Joshi, V., Jaiman, R., Altshuler, D. (2020). Morphing-induced changes in local wing stiffness and its effect on flight performance in birds. Gordon Research Conference: Multifunctional Materials and Structures, Ventura, CA, USA. *(poster)*

Wong, JCM., Joshi, V., Jaiman, R., Altshuler, D. (2020). Wing morphing during avian flight induces changes in local wing stiffness which affect aeroelastic response. The Society for Integrative and Comparative Biology, Austin, TX, USA. *(poster)*

Wong, JCM., Cao, Y., Ye, W., Liu, H. (2015). Effect of Endothelial Cell Morphology on Hemodynamic Forces in Blood Transport. 19th Annual Conference of HKSTAM, Hong Kong. *(talk)*

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Awards and Fellowships

Four Year Doctoral Fellowship
Department of Zoology, UBC, 2016-2020
$18,200/year

Werner and Hildegaard Hesse Research Award in Ornithology
Department of Zoology, UBC, 2018
$6000

Skills

Languages
English, French, Cantonese (conversational)

Computer Work
C++, Java, Python, Matlab, R, LaTeX
AutoCAD, Rhinoceros, Maya, Gmsh
ImageJ
XFLR5

Crafting
Machining
Electronic assembly

Online Courses
Aerodynamics *(EdX)*
Mechanical Behaviour of Materials *(EdX)*
Fundamentals of Fluid-Solid Interactions *(Coursera)*

Memberships

The Society for Integrative and Comparative Biology