Jasmin C.M. Wong

Senior Research Associate · Civil, Aerospace and Design Engineering

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Education

University of British Columbia *Vancouver, Canada*

PhD Zoology *September 2016 - April 2022*

- Dissertation: Flexible and coupled structural systems during avian wing morphing
- Advisor: Prof. Doug Altshuler

Hong Kong University of Science and Technology *Hong Kong*

MPhil Bioengineering *September 2014 - August 2016*

- Dissertation: The effect of endothelial cell morphology on wall shear stress during blood transport
- Advisor: Prof. Wenjing Ye, Prof. Hao Liu

McGill University *Montreal, Canada*

BSc Physiology *September 2009 - May 2013*

- Supervisor: Prof. Luc Mongeau

Professional Experience

2022-Now	**Senior Research Associate**, University of Bristol
2020-2022	**Graduate Teaching Assistant**, Department of Zoology, University of British Columbia
2014-2016	**Graduate Teaching Assistant**, Department of Bioengineering, Hong Kong University of Science and Technology
2013	**Research Assistant**, Department of Bioengineering, Hong Kong University of Science and Technology
2012-2013	**Research Assistant**, Department of Mechanical Engineering, McGill University
2011	**Research Assistant**, Pacific Parkinson's Research Centre, University of British Columbia

Research Skills

Experimental Fluid-Structure Interactions

Vibration Testing Impulse and acoustic frequency sweeps on wing specimens and live, anaesthetised birds using piezoelectric actuators and sensors, laser vibrometers, and high speed cameras.

Wind Tunnel Testing Experimental design and fabrication, working with actuators, telemetry and data loggers.

Frequency Analysis Conceptualisation of new methods for quantifying changes in vibration responses for biological structures, and application of multivariate variation mode decomposition for output-only modal analysis.

Comparative Biomechanics

Flight behaviour Acquiring wing morphing and flight trajectories using high speed cameras or attached infrared motion tracking beads on birds.

Mechanical Testing Materials testing using Instron Materials Testing Systems and strain gauges on wing specimens and live, anaesthetised birds.

Geometric Morphometrics Quantification of feather shape variation in relation to flight function.

Wing Aerodynamics Deriving flight forces and dynamics based on feather and wing shapes using analytical models and experimental testing.

Immunohistochemistry Specimen and slide preparation, staining, and microscopy.

Phylogenetic Analysis Analysing form-function relations using multivariate models with incorporated phylogenetic effects in R.

Computational Modelling and Simulation

Trajectory Optimisation Analytical modelling and optimisation of zebra finch trajectories to test hypotheses on flap-bounding flight behaviour using Python.

Multiscale Simulation Conceptualisation of computationally efficient algorithms to simulate effects of microscale endothelial cell in macroscale blood flow using C++, Fortran, and Python.

Fluid-Structure Simulation Using simulation to quantify flow vorticity and gliding performance in morphing wings of varying stiffness, exploration of parameter spaces when parameters are closely coupled in nature.

Photogrammetry Reconstruction of 3D models from 2D images from CT scans of aortas using Maya and from high speed video images of wing feathers using R and XFLR5.

Publications

Published

Wong, JCM, Joshi, V, Jaiman, RK, Altshuler, DL. 2025. Wing extension-flexion coupled aeroelastic effects improve avian gliding performance. Journal of the Royal Society Interface, 22(226): 1-15.

Harvey, C, Baliga, VB, **Wong, JCM**, Altshuler, DL, Inman, DJ. 2022. Birds can transition between stable and unstable states via wing morphing. Nature, 603(7902): 648-653.

Wong, JCM. 2022. Flexible and coupled structural systems during avian wing morphing. University of British Columbia. *Thesis*.

Wong, J. 2016. The effect of endothelial cell morphology on wall shear stress. Hong Kong University of Science and Technology. *Thesis*.

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 Mechanica Sinica, 31: 446-464.

In Prep

Wong, JCM, Baliga, VB, Altshuler, DL. Shaping flight: consistent morphological patterns reflect the influence of aerodynamic performance in flight feathers. Journal of Morphology.

Bodin, C, **Wong, JCM**, Windsor, SP, Woolley, SC. Tracking zebra finch flap-bounding behavior using DeepLabCut. Journal of Experimental Biology.

Wong, JCM, Windsor, SP. The influence of flight style on vibration responses in avian feathers.

Awards, Fellowships, & Grants

2025	**Student/Postdoc Travel Award**, Bio-Inspired Sensing Collaborative International Teams, Air Force Office of Scientific Research	*$ 3,250*
2023	**Travel Exchange Award**, Bio-Inspired Sensing Collaborative International Teams, Air Force Office of Scientific Research	*$ 5,000*
2016-2020	**Four Year Doctoral Fellowship**, Department of Zoology, University of British Columbia	*$ 18,200/year*
2018	**Werner and Hildegaard Hesse Research Award in Ornithology**, Department of Zoology, University of British Columbia	*$ 6,000*

Presentations

Invited Talks

May 2025. *Passive structures, Active Insight: How Feathered Wings Tune Aeroelastic Responses for Flight Behaviours*. Invited Lecture: XXXIV International Conference on Adaptive Structures, Capua, Italy.

June 2024. *Feathers as multi-functional aeroelastic structures for flight*. Invited talk: MorphoTalks, Bristol, UK.

December 2023. *Flapping Flight Aerodynamics*. Guest Lecture: Aerial Robotics, University of Bristol, UK.

May 2023. *Feathers as multi-functional aeroelastic structures for flight*. Invited talk: MAE297 Seminar, Davis, USA.

March 2023. *Feathers: a multi-functional structural system for flight and sensing*. Invited talk: SOAR-BISCIT Workshop, Arlington, USA.

December 2022. *Flapping Flight Aerodynamics*. Guest Lecture: Aerial Robotics, University of Bristol, UK.

Contributed Presentations

Wong, JCM, Burnett, N., Windsor, SP., Combes, S. 2025. Fluid-induced vibration patterns in biological structures. Poster: Society for Integrative and Organismal Biology, Atlanta, USA.

Wong, JCM, Windsor, SP. 2024. Decoding aeroelastic response in flight feathers for flow sensing. Oral presentation: Society for Experimental Biology, Prague, Czech Republic.

Wong, JCM, Windsor, SP. 2024. The effect of wing morphing on the vibration properties of feathers in relation to air flow sensing. Oral presentation: Society for Integrative and Organismal Biology, Seattle, USA.

Wong, JCM, Windsor, SP. 2023. Feathers as mechanical filters for flow sensing. Oral presentation: Society for Integrative and Organismal Biology, Austin, USA.

Wong, JCM, Joshi, V, Jaiman, RK, Altshuler, DL. 2022. Flexible and coupled structural systems during avian wing morphing. Oral presentation: Society for Experimental Biology, Montpellier, France.

Wong, JCM, Joshi, V, Jaiman, RK, Altshuler, DL. 2020. Morphing-induced changes in local wing stiffness and its effect on flight performance in birds. Poster: Gordon Research Conference on Multifunctional Materials and Structures, Ventura, USA.

Wong, JCM, Joshi, V, Jaiman, RK, Altshuler, DL. 2020. Wing morphing during avian flight induces changes in local wing stiffness which affect aeroelastic response. Poster: Society for Integrative and Organismal Biology, Austin, USA.

Wong, JCM, Cao, Y, Ye, W, Liu, H. 2020. Effect of Endothelial Cell Morphology on Hemodynamic Forces in Blood Transport. Oral presentation: 19th Annual Conference of HKSTAM, Hong Kong.

Media Coverage

August 2022. *Geometric Analysis Reveals How Birds Mastered Flight*. Quanta Magazine.

April 2022. *Bird Flight Biomechanics*. Researchers Revealed, Beaty Biodiversity Museum.

March 2022. *To be (stable) or not to be*. Behind the Paper, Ecology & Evolution.

Teaching Experience

2022	**Fundamentals of Physiology**, Teaching Assistant
2020-2021	**Introduction to Animal Mechanics and Locomotion**, Teaching Assistant
2020	**Zoological Physics**, Teaching Assistant
2016	**Introduction to Bioengineering**, Teaching Assistant
2015	**Bioengineering Graduate Seminar**, Teaching Assistant

Mentoring

2025	**Xinyu Qi**, MSc Robotics, University of Bristol
2024-2025	**Griffin Emter**, Undergraduate Research Project (RP4), University of Bristol
2024-2025	**Theo Copestake**, Undergraduate Research Project (RP3), University of Bristol
2024	**Griffin Emter**, Undergraduate Summer Intern, University of Bristol
2023-2024	**Griffin Emter**, Undergraduate Research Project (RP3), University of Bristol
2023-2024	**Ivan Castrue**, Undergraduate Research Project (RP3), University of Bristol
2023	**Zenhai Hou**, MSc Aerial Robotics, University of Bristol
2022-2023	**Giovanna Vilela Santos Sousa**, Undergraduate Research Project (RP3), University of Bristol

Outreach & Professional Development

Service and Outreach

2024 **International Micro Air Vehicles Conference**, Outdoor Competition Judge and Data Analyst

2021-2023 **UBC Biomechanics Journal Club**, Organiser

2022 **Science Rendezvous**, Contributed Talk

Development

Intro to Postgraduate Taught Supervision, a workshop and discussion on topics and good practices relevant to lead supervisors on postgraduate research projects.

Intro to Writing a Grant Proposal, a workshop covering the structure of grant applications in science and engineering, with discussion of successful proposals and information on available tools and support.

Managing Research Teams, a workshop providing practical information and updated tools for managing a collaborative and inclusive research groups.

Introduction to Equality, Diversity and Inclusion, training on how to build a strong scientific community consisting of a peoples from a wide range of backgrounds.

General Visual Line of Sight Certificate (GVC), theory and practical training and certification provided by Global Drone Training. This certificate allows for Remote Pilot Operational Authorisation issued by the UK Civil Aviation Authority.

Wilderness First Aid, practical training on life-saving first aid in remote and difficult environments.

Machining, practical training on CAD modelling and machining equipment provided by Centennial College (Canada) and the University of Bristol Technical Services (UK).

Electronic Assembly, practical training on circuit design and assembly provided by Centennial College (Canada).

Peer Review

Royal Society Interface
Integrative Organismal Biology
American Naturalist
Bioinspiration & Biomimetics

Professional Memberships

Society for Integrative and Comparative Biology (Division of Vertebrate Morphology, Division of Comparative Biomechanics)
Society for Experimental Biology
British Ecological Society