Hangjian Ling, PhD

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EDUCATION

2017 Ph.D., Mechanical Engineering, Johns Hopkins University
2013 M.S., Mechanical Engineering, Johns Hopkins University
2011 B.S., Theoretical and Applied Mechanics, University of Science and Technology of China

ACADEMIC POSITIONS

2019−Present **University of Massachusetts Dartmouth**
Assistant Professor, Mechanical Engineering

2017−2019 **Stanford University**
Postdoctoral Fellow, Civil and Environmental Engineering
with Professor Nicholas Ouellette

2011−2017 **Johns Hopkins University**
Graduate Research Assistant, Mechanical Engineering
with Professor Joseph Katz

2009−2011 **University of Science and Technology of China**
Undergraduate Graduate Research Assistant, Mechanical Engineering
with Professor Jiming Yang, Yujian Zhu

GRANTS RECEIVED

1. "Mechanism of gas depletion on super-hydrophobic surfaces in turbulent flows", **National Science Foundation**, $299,778, 01/01/2021 to 12/31/2023.
2. "Anti-biofouling property and lifetime of super-hydrophobic surfaces in marine environment", **UMassD MUST Program funded by Office of Naval Research**, $197,813, 02/01/2020 to 01/31/2023. (PI: Ling; Co-PI: Pia Moisander, Wei-Shun Chang)

PUBLICATIONS

Google Scholar Profile: https://scholar.google.com/citations?user=MWq3Y7oAAAAJ&hl=zh-CN

A. Peer-reviewed journal publications

1. **H. Ling**, "Three-Dimensional Measurement of a Particle Field Using Phase Retrieval Digital Holography". *Applied Optics* **59** (12): 3551-3559 (2020).
2. **H. Ling**, G. E. McIvor, J. Westley, K. van der Vaart, R. T. Vaughan, A. Thornton, N. T. Ouellette, "Behavior plasticity and the transition to order in jackdaw flocks". *Nature Communications* **10**: 5174 (2019).
3. **H. Ling**, G. E. McIvor, J. Westley, K. van der Vaart, R. T. Vaughan, A. Thornton, N. T. Ouellette, "Collective turns in jackdaw flocks: kinematics and information transfer". *Journal of the Royal Society Interface* **16**(159): 20190450 (2019).

4. **H. Ling**, G. E. McIvor, K. van der Vaart, R. T. Vaughan, A. Thornton, N. T. Ouellette, "Local interactions and their group-level consequences in flocking jackdaws". *Proceedings of the Royal Society B* **286**: 20190865 (2019).
5. **H. Ling**, G. E. McIvor, K. van der Vaart, R. T. Vaughan, A. Thornton, N. T. Ouellette, "Costs and benefits of the social relationship in the collective motion of bird flocks". *Nature Ecology and Evolution* **3**(6): 943-948 (2019).
6. **H. Ling**, G. E. McIvor, G. Nagy, S. MohaimenianPour, R. T. Vaughan, A. Thornton, N. T. Ouellette, "Simultaneous measurements of three-dimensional trajectories and wingbeat frequencies of birds in the field". *Journal of the Royal Society Interface* **15**(147): 20180653 (2018).
7. **H. Ling**, M. Fu, M. Hultmark, J. Katz, "Effect of Reynolds number and saturation level on gas diffusion in and out of a super-hydrophobic surface". *Physical Review Fluids* **2**(12): 124005 (2017).
8. **H. Ling**, S. Srinivasan, K. Golovin, G. H. McKinley, A. Tuteja, J. Katz, "High resolution velocity measurement in the inner part of turbulent boundary layers over super-hydrophobic surfaces". *Journal of Fluid Mechanics* **801**: 670-703 (2016).
9. **H. Ling**, J. Katz, "Separating twin images and locating the center of a microparticle in dense suspensions using correlations among reconstructed fields of two parallel holograms". *Applied Optics* **53**(27): G1-G11 (2014).
10. M. Xu, **H. Ling**, L. Wang, J. Yang, X. Luo, Q. Ma, T. Zhao, "The application of PIV technique for the investigation of oil-water two phase flow". *Journal of Experiments in Fluid Mechanics* **26**(1): 12-15 (2012). (*in Chinese version*).

B. Conference publications

11. G. Nagy, A. Thornton, **H. Ling**, G. E. McIvor, N. T. Ouellette, R. T. Vaughan, "Computational and Structural Advantages of Pairwise Flocking". *IEEE International Symposium on Multi- Robot and Multi-Agent Systems* (2019).
12. **H. Ling**, S. Srinivasan, K. Golovin, V. Pillutla, Abhijeet, G. H. McKinley, A. Tuteja, W. Choi, J. Katz, "Flow structure and turbulence in the inner part of turbulent boundary layers over super-hydrophobic surfaces". *The 31st Symposium on Naval Hydrodynamics*, Monterey, CA (2016).
13. V. Pillutla, Abhijeet, **H. Ling,** L. Rodriguez, D. B. C. Rodrigues, J. Katz, W. Choi, "Robust drag reduction superhydrophobic surfaces with large slip lengths". *The 31st Symposium on Naval Hydrodynamics*, Monterey, CA (2016).
14. **H. Ling,** Y. Zhu, R. Xiong, L. Wang, F. Xiao, M. Xu, J. Yang, "The behaviors of a drop in ambient liquid under a sudden impact". *The 28th International Symposium on Shock Waves*, Manchester, UK (2011).

C. Work submitted

15. **H. Ling** , K. Sridhar, S. Gollapudi, J. Kumar, R. S. Ohgami, "Measurement of cell volume using inline digital holography". *submitted*.
16. M. Shangraw, **H. Ling**, "Separating twin images in digital holographic microscopy using weak scatterers". *submitted*.

CONFERENCE PRESENTATIONS

1. "Improvement of particle detection accuracy in digital holographic microscopy by phase retrieval method", *APS Division of Fluid Dynamics*, Virtual, 2020.
2. "Behavioral plasticity in jackdaw flocks", *APS March Meeting*, Denver, CO, 2020.
3. "Effect of Social Relationships on the Collective Motion of Bird Flocks", *APS March Meeting*, Boston, MA, 2019.
4. "High-Precision Three-Dimensional Tracking of Birds in the Field", *Conference on Collective Behavior by ICTP*, Trieste, Italy, 2018.
5. "Gas diffusion in and out of super-hydrophobic surface in transitional and turbulent boundary layers", *APS Division of Fluid Dynamics*, Denver, CO, 2017.
6. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, United States Naval Academy, 2017.
7. "Effects of roughness height, pressure and streamwise distance on stress profiles in the inner part of turbulent boundary layer over super-hydrophobic surfaces", *APS Division of Fluid Dynamics*, Portland, OR, 2016.
8. "Flow structure and turbulence in the inner part of turbulent boundary layers over super-hydrophobic surfaces", *The 31st Symposium on Naval Hydrodynamics*, Monterey, CA, 2016.
9. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, University of Michigan, 2016.
10. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, Johns Hopkins University, 2016.
11. "Velocity and Reynolds Stress Profiles in The Inner Part of a Turbulent Boundary Layer over Super-Hydrophobic Surfaces", *APS Division of Fluid Dynamics*, Boston, MA, 2015.
12. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, Princeton University, 2015.
13. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, Stanford University, 2015.
14. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *APS Division of Fluid Dynamics*, San Francisco, CA, 2014.
15. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *ONR-MURI program review meeting*, Stanford University, 2014.
16. "Real and virtual image separation in digital in-line holographic microscopy by recording two parallel holograms", *APS Division of Fluid Dynamics*, Pittsburgh, PA, 2013.

TEACHING EXPERIENCES

University of Massachusetts Dartmouth

- *Instructor*, PHY-101: Introduction to Physics I — Fall 2020
- *Instructor*, MNE-504: Adv. Mechanics of Fluids — Fall 2019

Johns Hopkins University

- *Tutor*, "Thermodynamics", Mechanical Engineering Fall 2014
- *Teaching Assistant*, "Fluid Dynamics II", Mechanical Engineering Spring 2013
- *Teaching Assistant*, "Thermodynamics", Mechanical Engineering Fall 2012

OTHER PROFESSIONAL ACTIVITIES

A. Invited academic talks

1. "Applications of particle tracking technology for understanding boundary layer flows and collective motions", *Department of Civil and Environmental Engineering Graduate Seminar*, University of Pittsburgh, PA, August 28, 2020 (virtual seminar via Zoom).
2. "Applications of particle tracking technology for understanding boundary layer flow and collective motion", *Fluid & Thermal Science, School of Engineering Joint seminar*, Brown University, RI, March 3, 2020.
3. "Applications of particle tracking in turbulent boundary layers and animal collective motion", *Estuarine and Ocean Science seminar*, University of Massachusetts Dartmouth, MA, October 23, 2019.
4. "Collective behavior in natural and artificial worlds", *Stanford Chinese Postdoc Symposium*, Stanford, CA, 2019.
5. "Friction Drag Reduction in Turbulent Flow by Super-Hydrophobic Surfaces", *Mechanical Engineering seminar*, George Mason University, VA, 2017.
6. "High-resolution velocity measurement in inner parts of turbulent boundary layers over super-hydrophobic surfaces", *Research Symposium on Environmental and Applied Fluid Dynamics*, George Washington University, DC, 2015.

B. Journal reviewer (performed for a total 28 reviews)

- *Applied Optics*
- *Flow, Turbulence and Combustion*
- *International Journal of Heat and Fluid Flow*
- *Journal of Applied Fluid Mechanics*
- *Journal of Theoretical Biology*
- *Optics Express*
- *Optics Letter*
- *PLOS Computational Biology*
- *PLOS ONE*
- *Scientific Report*

C. Grant reviewer

- NSF reviewer 2020

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Physical Society