Jian Teng, Ph.D.

Postdoctoral Associate at Rice University

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Education

- **Ph.D. in Engineering**, Area of Study: **Fluids and Thermal Sciences** October 2024
  Brown University
  - Thesis: Lubrication models for fluid and structure interactions in microfluidic environments
  - Advisor: Dr. Jesse T. Ault
- **M.S. in Mechanical Engineering** May 2020
  The University of Iowa
  - Thesis: Wind farm wake modeling for power prediction and detection of wildlife activity using X-band Doppler radar
  - Advisor: Dr. Corey Markfort
- **B.S.E. in Mechanical Engineering with Mathematics minor** May 2018
  The University of Iowa
  - Study Abroad: Hong Kong University of Science and Technology, Hong Kong, Summer 2015

Research Interests

Fluid Mechanics, Soft Matter, Additive Manufacturing, Computational Fluid Dynamics (CFD), Heat and Mass Transfer, Scientific Computing, Complex Fluids, Electrokinetics, Thin-film Flow

Research Experiences

- **Postdoctoral Associate, Rice University** 09/24–Current
  Department of Mechanical Engineering, Advisor: Dr. Yong Lin Kong
  - Innovate and develop near-field microwave 3D printing technique for material manufacturing
  - Lead research in the investigation of focused dewetting in quantum dot depositions
  - Solve fundamental thermal-fluid challenges to improve micro-robotics and biomedical devices
- **Research Scientist I / Technical Intern III, Tokyo Electron Limited (TEL)** 06/24–09/24
  Advanced Technology Group, TEL, Austin, TX, USA
  - Developed multi-physics simulations in COMSOL for single wafer wet etching processes
  - Built a custom solver on COMSOL to model thin-film flow in the rotating reference frame
  - Developed a mathematical framework for modeling conjugate heat transfer and chemical reactions, coupled with the 2D thin-film flow model
- **Research Assistant, Brown University** 9/20–05/24
  Fluids and Thermal Sciences Group, School of Engineering

- Led a team of 4 researchers in theoretically and numerically modeling the dynamics of rod-like objects moving near boundaries, with applications in modeling bacterial swimming
- Studied fluid and transport phenomena in fluidic systems using OpenFOAM and MATLAB
- Mentored 3 undergraduate students and served as technical lead for CFD simulation projects

- **Graduate Research Assistant, The University of Iowa** 8/18–5/20
  Environmental Fluid Mechanics and Renewable Energy Laboratory, The University of Iowa
  - Collaborated with wind farm operators and meteorologists to predict wind distribution within and around a large wind farm using analytical and machine learning methods
  - Improved wind farm power prediction accuracy by 3%
- **Research Intern, Machine Learning, IIHR-Hydroscience & Engineering** 5/18–8/18
  - Applied machine learning methods for wind farm bat risk assessment (News highlight)
  - Planned and designed multi-instrument bat detection experiment within a wind farm in Iowa
- **Mechanical Engineering Research Assistant, The University of Iowa** 5/17–1/18
  Environmental Flume Facility, Department of Mechanical Engineering
  - Conducted fluid dynamics experiments using Laser Doppler Velocimetry (LDV), Particle Image Velocimetry (PIV), and Hot-wire Anemometer to investigate the wake behind a moving ship

Publications

1. T. Greenwood, B. Elder, MN. Hassan, J. Anklam, S. Lee, **J. Teng**, P. Wang, and Y.L. Kong. Soft multi-stable magnetic-responsive metamaterials. *Science Advances*, 2025 [News report]
2. T. Greenwood, F. Cordoba, **J. Teng**, S. Lee, G. Dare, E. Demir, O.S. Pak, and Y.L. Kong. Curvature-dependent propulsion of elastic flagella. *Soft Matter*, 2025 [**Emerging Investigator in Soft Matter Award**]
3. S. Ghosh, R. Neupane, D. Sahu, **J. Teng**, and Y.L. Kong. The continuous actuation of liquid metal with a 3D-printed electrowetting device. *Med-X* 2025 [**Med-X Young Investigator Award**]
4. **J. Teng***, S. La, and J. Ault. Newtonian fluid dynamics in a misaligned parallel-plate rheometer. *Physical Review Fluids*, 2024
5. **J. Teng**, B. Rallabandi, and J. Ault. Diffusioosmotic dispersion of solute in a long channel. *Journal of Fluid Mechanics*, 2023
6. **J. Teng**, B. Rallabandi, H.A. Stone, and J. Ault. Coupling of translation and rotation in the motion of finite-length rods near solid boundaries. *Journal of Fluid Mechanics*, 2022
7. **J. Teng**, and C. Markfort A calibration procedure for an analytical wake model using wind farm operational data. *Energies*, 2020
8. S. Prakash, **J. Teng**, J. Niemeier, D. Wu, A. Kruger, and C. Markfort. **Developing technologies for detecting and quantifying bat behavior and fate at wind turbines**. *Technical Report (#421) submitted to MidAmerican Energy Company by IIHR-Hydroscience and Engineering, University of Iowa, IA*, 2019

* denotes corresponding author

Work in Progress

1. **J. Teng**†, S. Hales†, X. Yang†, J. Anklam†, S. Lee†, D. Sahu, L. Li, C. Latham, X. Tian, D. Wong, T. Greenwood, J.S. Ho, and Y.L. Kong. **Three-dimensional printing of nanomaterials-based electronics with metamaterial-inspired near-field electromagnetic structure**. *In revision, Science Advances*

2. **J. Teng**, S. Hales, S. Ghosh, Y. Liu, Y.L. Kong. **Focused dewetting in quantum dot depositions using a metamaterial-inspired near-field electromagnetic structure**. *In progress*

† denotes equal contribution

Awards

1. **Brown University Fellowship** - Brown University (2020)
2. **Brown University Graduate School Travel Fund** - Brown University Graduate School (2021–2023)
3. **Iowa Graduate Student Senate Travel Fund** - The University of Iowa (2020)
4. **Iowa Center for Global & Regional Environmental Research Travel Award** - The University of Iowa (2019)
5. **Received fully funded offer for Master's studies** - The University of Iowa (2018)
6. **2nd Place at 7th Greater China Design Competition** - Hosted by Institution of Mechanical Engineers (2018)
7. **Best Poster Award at the University of Iowa Engineering Research Open House** - The University of Iowa, College of Engineering (2018)
8. **Peace, Charlie One World Scholarship** - Awarded 2 out of ∼3000 international students, The University of Iowa (2017)
9. **Dean's List** - The University of Iowa, College of Engineering (2014–2017)
10. **University of Iowa International Scholar Award** - Awarded to top 5% international student, The University of Iowa (2014–2018)

Conference Presentations

1. **J. Teng**, T. Greenwood, F. Cordoba, S. Lee, G. Dare, E. Demir, O.S. Pak, and Y.L. Kong. **Curvature-driven bidirectional swimming of elastic flagella at low Reynolds numbers**. In *American Physical Society 78th Annual Meeting of the Division of Fluid Dynamics*, Houston, TX, USA, November 2025.

2. **J. Teng**, S. Lee, and Y.L. Kong. **Simulation-guided near-field microwave 3D printing**. In *COMSOL Multiphyscis Workshop & Poster Session*, Houston, TX, USA, March 2025.

3. **J. Teng**, B. Rallabandi, and J. Ault. **Diffusioosmotic dispersion in a long, narrow channel.** In *American Physical Society March Meeting 2024*, Minneapolis, MN, USA, March 2024.

4. **J. Teng**, S. La, C. Clynes, N. Koval, and J. Ault. **Theoretical and numerical models of depth-confined Brinkman flow**. In *American Physical Society 76th Annual Meeting of the Division of Fluid Dynamics*, Washington DC, USA, November 2023.

5. S. La, J. Ault, and **J. Teng**. **Newtonian fluid dynamics in a misaligned parallel-plate rheometer**. In *American Physical Society 76th Annual Meeting of the Division of Fluid Dynamics*, Washington DC, USA, November 2023.

6. **J. Teng**, B. Rallabandi, and J. Ault. **Diffusioosmotic dispersion in a long, narrow channel.** In *American Physical Society 75th Annual Meeting of the Division of Fluid Dynamics*, Indianapolis, IN, USA, November 2022.

7. **J. Teng**, B. Rallabandi, H. A. Stone, and J. Ault. **Dynamics of finite-length rods near solid boundaries.** In *American Physical Society 74th Annual Meeting of the Division of Fluid Dynamics*, Phoenix, AZ, USA, November 2021.

8. **J. Teng**, B. Rallabandi, and J. Ault. **Dynamics of finite rods near solid boundaries**. In *82nd New England Complex Fluids Workshop*, Brown University, Providence, RI, USA, March 2021.

9. **J. Teng**, H. Whitlow, J. Niemeier, J. Leckband, A. Kruger, and C. Markfort. **Monitoring bat activities at a large wind farm using an X-band radar and infrared cameras**. In *13th Wind Wildlife Research Meeting*, Virtual, December 2020.

10. **J. Teng** and C. Markfort. **Calibration procedure for Gaussian-based analytical wake model using SCADA data**. In *American Physical Society Division of Fluid Dynamics Annual Meeting 2020*, Virtual, November 2020.

11. **J. Teng**, B. Huo, J. Niemeier, J. Leckband, A. Kruger, and C. Markfort. **Monitoring Bat Activities at a Large Wind Farm Using an X-Band Radar and Infrared Cameras**. In *American Geophysical Union Fall Meeting 2019*, San Francisco, CA, December 2019.

12. **J. Teng** and C. Markfort. **Strategies for Mitigating Bat Impacts Using Smart Wind Turbine Curtailment**. In *The NAWEA/WindTech 2019 Conference*. Amherst, MA, October 2019.

13. **J. Teng**, C. Markfort, and A. Kruger. **Developing Technologies for Detecting and Understanding Bat Emergence Within a Wind Farm**. In *UI Engineering Research Open House*, Iowa City, IA, April 2019.

14. **J. Teng** and C. Markfort. **Investigation of the Relationship Between the Wind Turbine Operating Conditions and Bat Fatality**. In *UI Engineering Research Open House*, Iowa City, IA, November 2018. *(Best Poster Award)*

Teaching Experiences

1. **Water Supply and Treatment Systems: ENGN 1340**, Lab Instructor, Brown University Spring 2023
   - Designed and taught water treatment experiments for 20+ students
2. **Heat Transfer: ENGN 1710**, Lab Instructor & Teaching Assistant, Brown University Spring 2022
   - Taught computational lab using COMSOL for 30+ students
   - Led experimental session for small group of students
3. **Experimental Engineering: ME 4080**, Teaching Assistant, The University of Iowa Spring 2018
   - Senior-level undergraduate experimental class with 30+ students
   - Taught students how to use mechanical lab equipment and measurement systems
4. **Thermodynamics: ENGR 2130**, Teaching Assistant, The University of Iowa Spring 2017
   - Assisted 2 instructors for 150+ freshman and sophomore level engineering students
5. **Statics: ENGR 2110 (Online Course)**, Teaching Assistant, The University of Iowa Summer 2017
   - Hosted online discussion section for 30+ students

6. **Dynamics: ENGR 2710**, Discussion Section Instructor, The University of Iowa Fall 2016
    - Instructed 70+ students on studies of particle motion and rigid body motion

Advising and Mentoring

Doctoral students:

1. **Brian Elder:** (10/24 – 08/25). Mechanical Engineering, Rice University, Project: *Multiscale 3D printing of active metamaterial structures with functional nanomaterials*
2. **Jared Anklam:** (10/24 – Now). Mechanical Engineering, University of Utah, Project: *Numerical simulation of magnetic actuation of metamaterials*
3. **Edison Gong:** (07/25 – Now). Mechanical Engineering, Rice University, Project: *Ingestible electronics*

Undergraduate students:

1. **Sungwon La:** (1/23 – 05/24). Mechanical Engineering, Brown University
   Current: Ph.D. student at Stanford University
2. **Charlie Clynes:** (5/23 – 09/23). Applied Mathematics, Brown University
3. **Nazarii Koval:** (5/23 – 09/23). Mechanical Engineering, Brown University
   Current: Ph.D. student at Caltech
4. **Cassey Wang:** (06/25 – Now). Mechanical Engineering, Rice University

Leadership Experiences

- **Graduate Council**, Brown University Graduate School 9/21–7/22
    - Set university-wide policy for the Graduate School and reviewed graduate programs
- **President**, American Wind Energy Association (AWEA) Iowa Student Chapter 1/16–5/18
- **Team Leader**, Virtual International Project Team (Robotics), The University of Iowa 8/17–5/18
    - Awarded 2nd Place at 7th Greater China Design Competition hosted by IMechE

Professional Service

1. **Professional Society Memberships:** American Physical Society (APS), American Geophysical Union (AGU), American Wind Energy Association (AWEA)
2. **Peer reviewer:** Journal of Fluid Mechanics, Langmuir, Heat Transfer Engineering, APL Machine Learning

Skills

Languages/Programming:
C++, Python, MATLAB, LaTeX
Softwares:
Autodesk, ANSYS Fluent, CREO Parametric, SolidWorks, Tecplot, LabVIEW, COMSOL, OpenFOAM, Adobe Illustrator, Inkscape