

# JINYUAN LIU

Department of Mechanical and Aerospace Engineering,

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## EDUCATION

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### Ph. D. Student

Jan. 2021 – present

Department of Mechanical and Aerospace Engineering, UC San Diego

Advisor: Sutanu Sarkar

- Topic: Vortex dynamics, coherent structures, instabilities, and turbulence in stratified, rotating wakes

### B. S. E., Engineering Thermo-physics (with distinction)

Aug. 2016 – June 2020

Department of Engineering Mechanics, Tsinghua University

- Dissertation Title: Large- and very-large-scale structures in turbulent channels

### Visiting Research Student

Sep. 2019 – Mar. 2020

School of Aeronautics, Universidad Politécnica de Madrid

Advisor: Javier Jiménez

- Topic: Lifetime of the largest structures in turbulent channels at  $Re_\tau = 2000, 5300$ .

## AWARDS

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Academic Distinction Award for Graduates, Tsinghua University	2020
Outstanding Undergraduate Dissertation, Tsinghua University	2020
Second Prize for Student Research Training, Tsinghua University	2019
Scholarship for Scientific Innovation, Tsinghua University	2018
Scholarship for Overall Excellence, Tsinghua University	2018
Scholarship for Academic Distinction, Tsinghua University	2017, 2018, 2019
First Prize, National Aerospace Knowledge Competition for College Students	2018
Outstanding Teaching Assistant of The Year, MAE Department, UC San Diego	2023–2024

## FELLOWSHIPS AND MEMBERSHIPS

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Fellowship, the fifth Madrid Turbulence Summer School, Universidad Politécnica de Madrid	2023
Fellowship, Spark Innovative Talent Cultivation Program, Tsinghua University	2018
Student Membership, American Physical Society, Division of Fluid Dynamics	since 2019
Student Membership, American Institute of Aeronautics and Astronautics	since 2024

## RESEARCH EXPERIENCE

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### Graduate Research Assistant

Jan. 2021 – present

Mechanical and Aerospace Engineering, UC San Diego

Advisor: Sutanu Sarkar

### Post-baccalaureate Research Assistant

July 2020 – Dec. 2020

Department of Engineering Mechanics, Tsinghua University

Advisor: Wei-Xi Huang

### Research Assistant

Sep. 2019 – Mar. 2020

School of Aeronautics, Universidad Politécnica de Madrid

Advisor: Javier Jiménez

## Visiting Research Assistant

Mechanical and Mechatronics Engineering, University of Waterloo  
Advisors: Jean-Pierre Hickey and Xiaohua Wu

July 2019 – Aug. 2019

## PUBLICATIONS AND TALKS

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### Publications and preprints

3. Jinyuan Liu, Pranav Puthan, and Sutanu Sarkar. Effect of rotation on wake vortices in stratified flow. *in press, J. Fluid. Mech.*, 2024 ([arXiv](#)) ([pdf](#))
2. Jinyuan Liu and Sutanu Sarkar. Coherence analysis of geophysical wakes in flow past a three-dimensional hill. In *Journal of Physics: Conference Series (Proceeding for the fifth Madrid Turbulence Summer School)*. IOP Publishing, 2024 ([pdf](#))
1. Chunmei Xie, Jinyuan Liu, Jing-Wei Jiang, and Wei-Xi Huang. Numerical study on wetted and cavitating tip-vortical flows around an elliptical hydrofoil: Interplay of cavitation, vortices, and turbulence. *Physics of Fluids*, 33(9):093316, 2021 ([link](#)) ([pdf](#))

### Talks and conference presentations

8. The 77th Annual Meeting of APS DFD, Salt Lake City, November 2024.
7. Workshop on Coherent Structures for Turbulence Modeling, Santa Fe, November 2024.
6. The 17th SoCal Fluids Symposium, UCI, Irvine, April 2024.
5. Ocean Science Meeting 2024, New Orleans, February 2024.
4. The 76th Annual Meeting of APS DFD, Washington DC, November 2023.
3. The 16th SoCal Fluids Symposium, SDSU, San Diego, April 2023.
2. The 75th Annual Meeting of APS DFD, Indianapolis, November 2022.
1. The 15th SoCal Fluids Symposium, UCLA, Los Angeles, April 2022.

## TEACHING ACTIVITIES

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### Teaching Assistant, UC San Diego

MAE290B Numerical Methods for ODE & PDE Simulations (graduate level)  
Instructor: Sutanu Sarkar

Winters 2022,2023,2024

### Teaching Assistant, UC San Diego

MAE214A Introduction to Turbulence and Turbulent Mixing (graduate level)  
Instructor: Sutanu Sarkar

Springs 2022,2023

## MENTORING EXPERIENCE

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Chenyao Luo (Master of Science in Fluid Mechanics)

Thesis topic: Simulation and modal analysis of two-dimensional wakes

2022 – 2023

## SERVICES

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Referee for: *Journal of Fluid Mechanics, Physics of Fluids, Acta Mechanica Sinica*  
Association Chair, the 12<sup>th</sup> Spark Innovative Talent Cultivation Program, Tsinghua University  
Peer Mentor of 15 freshmen, School of Aerospace, Tsinghua University 2018,2019  
JUMP Mentor of 8 freshmen, Jacob School of Engineering, UC San Diego 2020,2021

**TECHNICAL SKILLS**

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<b>Programming Languages</b>	FORTRAN, C++, MATLAB, Python, L <sup>A</sup> T <sub>E</sub> X, Bash(Unix Shell)
<b>Numerical Packages</b>	MPI, HDF5, FFTW, LAPACK, SCALAPACK, BLAS, FISHPACK
<b>Software Capability</b>	ParaView, Tecplot, OriginPro, OpenFOAM, Mathematica
<b>CAE Usage (rarely)</b>	AutoCAD, SOLIDWORKS, ANSYS ICEM, ANSYS Fluent

**EXTRA-CIRRICULAR**

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Former member, the baseball team and the water polo team, Tsinghua University  
Former member, the swimming team, School of Aerospace, Tsinghua University  
Go (Wei-Qi) player ranked amateur 5-dan, Chinese Go Association 2013  
Honorary citizen, Tulsa, OK 2014  
Published Aviation Photographer (selected to the photography team of Airways Magazine)  
Trumpet player

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Updated: October 24, 2024