Ching-Te Lin

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Education

Ph.D. in Mechanical Engineering, *California Institute of Technology*   **Sept. 2023 – Present**
  Advisor: Dr. H. Jane Bae
  Research topic: Turbulent Flow Control via Fluid-Metamaterial-Interaction

M.S. in Mechanical Engineering, *National Taiwan University (NTU)*   **Sept. 2021 – Aug. 2023**
  Advisor: Dr. Hsieh-Chen Tsai
  Thesis title: Closed-loop Flow Control on Harmonic Oscillation of a Circular Cylinder

B.S. in Mechanical Engineering, *NTU*   **Sept. 2017 - Aug. 2021**

Journal Publication

- **C.-T. Lin** & H.-C. Tsai. (2024) Feedback flow control on a plunging circular cylinder. *Physics of Fluids* 1 April 2024; 36 (4): 047126. doi:10.1063/5.0203558
- **C.-T. Lin,** M.-L. Tsai, H.-C. Tsai (2023). Flow control of a plunging cylinder based on resolvent analysis. *Journal of Fluid Mechanics*, 967, A41. doi:10.1017/jfm.2023.526

Proceedings

- **C.-T. Lin**, V. Ramakrishnan, A. Goza, K. Matlack, H. J. Bae (2026) Dynamic passive control of turbulent drag via subsurface resonant phononic material. *AIAA SCITECH 2026* doi:10.2514/6.2026-2621
- D. Beckers, S. Balasubramanian, **C.-T. Lin**, A. Goza, H. J. Bae (2026) A High-Fidelity Simulation Framework for Turbulent Flows with Complex (Metamaterial) Structures. *AIAA SCITECH 2026* doi:10.2514/6.2026-2622
- **C.-T. Lin**, A. Goza, & H. J. Bae (2024). Active Control for Turbulent Drag Reduction by Periodic Blowing and Suction.   *AIAA AVIATION 2024.* doi:10.2514/6.202

Research & Project Experience

Graduate Research Assistant *in Bae Research Group, Caltech*   **Fall 2023 – Present**
- Develop a weakly-coupled simulation tool for fluid-metamaterial interaction
- Investigate the drag reduction under periodic blowing and suction in the channel flow

Research Assistant *in the Department of Mechanical Engineering, NTU*   **Spring 2021 – Aug. 2023**
- Applied Resolvent Analysis on a tilted flat plate to construct a reduced-order model with a relative error of 3% on the boundary
- Develop Floquet-based Resolvent Analysis and design an active flow control strategy on a plunging cylinder to attenuate lift fluctuation by up to 25.7%

Summer Research Intern, *Moldex3D (CoreTech System Co., Ltd.)*   **July 2020 - Aug. 2020**
- Performed plastic injection molding simulation via Moldex3D
- Improved unbalanced flow in multi-cavities with modified runners

Formula SAE Japan Racing Car, *NTU*   **Sept. 2018 - June 2020**
- Co-lead a team of 8 members to design brake, steering, and suspension systems for a racing car
- Performed finite element analysis to study the structure limit of the designed part

Selected conference presentation

- C.-T. Lin, V. Ramakrishnan, A. Goza, K. Matlack, H. J. Bae (2026) Dynamic passive control of turbulent drag via subsurface resonant phononic material. *AIAA SCITECH*
- C.-T. Lin, A. Goza, H. J. Bae (2025) Data-Driven Scaling of Turbulent Drag Response to Streamwise-Periodic Wall Transpiration. *Bulletin of the American Physical Society*
- C.-T. Lin, V. Ramakrishnan, A. Goza, K. Matlack, H. J. Bae (2024) Control for turbulent drag reduction by wall-normal blowing and suction. *Bulletin of the American Physical Society*
  C.-T. Lin, A. Goza, H. J. Bae (2024). Active Control for Turbulent Drag Reduction by Periodic Blowing and Suction.   *AIAA AVIATION.*

Honors & Awards

Ministry of Education Taiwan-Caltech Scholarship, *Ministry of Education, Taiwan*   **Sept. 2023**
- Awarded three Ph.D. students annually to support their Ph.D. studies for four years

Sing Lung Foundation Scholarship, *Sing Lung Foundation*   **Nov. 2022**

- Honored students with outstanding academic achievement in mechanical engineering

Dean's List Award, *NTU*   **Spring 2021**
- Awarded top five percent of students for excellent academic performance in the department of mechanical engineering

Teaching Experience

Graduate Teaching Assistant, *AE/ME 101A (fluid mechanics), graduate-level, Caltech*   **Fall 2024**
- Hold weekly office hours and a review section for 10 graduate-level students

Teaching Assistant, *Engineering Mathematics (1), (2), NTU*   **Fall 2021 – Spring 2023**
- Prepare and grade quizzes and assignments for the lecture, including ODE, linear algebra, complex analysis, and PDE
  Hold TA office hours and a review lecture of 1 hour for the midterm exam in English

Teaching Assistant, *Advanced Thermodynamics (I), graduate-level, NTU*   **Fall 2022**
- Hold weekly office hours to answer questions about the course from 50 graduate-level students

Teaching Assistant, *Fluid Mechanics, NTU*   **Spring 2022**
- Hold TA office hours and graded assignments and exams for 50 sophomore-level undergraduates

Skills

Programming Language: FORTRAN, MATLAB, Python, C++
Computer-Aid Design Software: SolidWorks, Autodesk Inventor, AutoCAD
Language: Mandarin (Native), English (Advanced)