Chenyang Huang

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Education

Shanghai Jiao Tong University — Shanghai, China
M.Eng. in Naval Architecture and Ocean Engineering — Sep 2020 - Mar 2023
- GPA: 3.88/4.00
- Teaching assistant for the course *Introduction to Marine Hydrodynamics*

Shanghai Jiao Tong University — Shanghai, China
B.Eng. in Naval Architecture and Ocean Engineering — Sep 2016 - Jun 2020
- GPA: 3.95/4.30; Ranking: 1/56

Research Interests

Fluid Mechanics, Computational Fluid Dynamics, Lagrangian Coherent Structures, Immersed Boundary Method, Fluid-Structure Interaction, Nonlinear Dynamics

Research Experiences

Lagrangian Coherent Structures in Flow Past a Backward-Facing Step — Sep 2021 - Jul 2022
- Performed direct numerical simulation of flow past a backward-facing step in a duct using OpenFOAM
- Uncovered the underlying flow structures by complementary qualitative and quantitative LCS analyses
- Investigated the interaction between hyperbolic and elliptic structures

Immersed Boundary Method and Applications — Mar 2021 - Mar 2022
- Employed a rotationally oscillating cylinder with an attached flexible filament to approximate tadpole locomotion
- Developed computational models to simulate this low-Reynolds-number flow based on different immersed boundary frameworks using IBAMR
- Studied the influence of head swing frequency and tail flexibility on the performance of tadpole propulsion

Flow Analysis Based on Lagrangian Coherent Structures — Jan 2020 - Jun 2020
- Conducted direct numerical simulations of lid-driven cavity flow and pitzDaily flow at different Reynolds numbers
- Extracted Lagrangian coherent structures based on both heuristic and analytical methods
- Analyzed physical mechanisms behind these two flows from the Lagrangian perspective

Flow and Magnetic Structures in a Kinematic ABC-Dynamo — Sep 2019 - Dec 2019
- Explored the relationship between the flow skeleton structures and the stagnation points of ABC-flow
- Visualized their evolutions in the parameter space of ABC-flow through 100 simulations

Publications

[1] **Chenyang Huang**, Alistair G.L. Borthwick, and Zhiliang Lin. Lagrangian coherent structures in flow past a backward-facing step. ***Journal of Fluid Mechanics***, 947:A4, 2022.

[2] Tao Zhang, ZhiLiang Lin, **Chenyang Huang**, and Alistair G.L. Borthwick. Flow and magnetic structures in a kinematic ABC-dynamo. ***Science China Physics, Mechanics & Astronomy***, 63(8):1–6, 2020.

Honors and Awards

National Scholarship for Graduate Student — Sep 2022
Second prize in the 17th China Post-Graduate Mathematical Contest in Modeling — Oct 2020
Outstanding Graduate of Shanghai Jiao Tong University — Jun 2020
National Scholarship for Undergraduate Student — Sep 2019
Meritorious Winner of Mathematical Contest in Modeling — Apr 2019

Technical Skills

Programming Languages: C++, MATLAB, Shell script, LaTeX
Open-source Software: OpenFOAM, IBAMR, Gmsh, ParaView, VisIt