HAOTIAN HANG

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PERSONAL INFO

Birth Year: 1997
Citizenship: People's Republic of China
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EDUCATION

2020 - **University of Southern California**, Los Angeles, CA
Ph.D. Student, Mechanical Engineering
Master of Science, Mechanical Engineering, December 2021

2015 - 2019 **Shanghai Jiao Tong University**, Shanghai, China
B.S. Aeronautics and Astronautics Engineering, June 2019 (Average Score: 89.22/100)

EMPLOYMENT

2020 - **Research Assistant**, Bio-Inspired Motion Lab at USC, PI: *Prof. Eva Kanso*

2019 **Intern Algorithmic Engineer**, Shanghai Hongpu Information Technology Co., Ltd.

2016 - 2019 **Research Assistant**, J.C.Wu Center for Aerodynamics, PI: *Prof. Hong Liu*

PUBLICATIONS

2022 3. Hang, H., Heydari, S., Costello, J., & Kanso, E. (2022). *Active tail flexion in concert with passive hydrodynamic forces improves swimming speed and efficiency*. Journal of Fluid Mechanics, 932, A35.

2021 2. Xiang, Y., Hang, H., Qin, S., and Liu, H. (2021). *Scaling analysis of the circulation growth of leading-edge vortex in flapping flight*. Acta Mech. Sin.

2020 1. Hang, H., Yu, B., Xiang, Y., Zhang, B., and Liu, H. (2020). *An objective-adaptive refinement criterion based on modified ridge extraction method for finite-time Lyapunov exponent (FTLE) calculation*. Journal of Visualization, 23(1), 81-95.

RESEARCH INTERESTS/EXPERIENCE

2020 - **Flowtaxis via RL**, supervised by *Prof. Eva Kanso*
joint with *Sina Heydari*, *Yusheng Jiao*, *Feng Ling*
Using reinforcement learning to follow vortical wakes based on local flow sensory
Find traveling wave characteristic of the wake is important for source seeking and our controller is stable in locating source
Discuss mechano- and chemo- sensing, and different sensory cues

2020 - **Flexion in fish swimming**, supervised by *Prof. Eva Kanso*, *Prof. John H. Costello*
joint with *Sina Heydari*
Study the role of active and passive flexion on swimming speed and efficiency of a self-propelling pitching plate using vortex sheet method
Parametric study on the effect of flexion phase, flexion angle and flexion ratio on swimming performance

2016 - 2019 **Mechanisms of high generation in insects flight**, supervised by *Prof. Hong Liu* and *Dr. Yang Xiang*
joint with *Dr. Suyang Qing*
Experimental study on the role of the phase difference on leading edge vortex formation using a scaled robotic flapping wing model in glycerin
Find a scaling law between passive rotation and active translation in flapping wing model

2016 - 2019 **AMR for FTLE calculation**, supervised by *Prof. Hong Liu*, *Prof. Bin Zhang*, *Bin Yu* and *Dr. Yang Xiang*
Construct a physics-based adaptive refinement method for finite-time Lyapunov exponent calculation

TALKS/PRESENTATIONS

2021	**APS Division of Fluid Dynamics Meeting**, Active tail flexion in concert with passive hydrodynamic forces improves swimming speed and efficiency
2020	**APS Division of Fluid Dynamics Meeting**, Flowtaxis in the wakes of oscillating airfoils
2018	**APS Division of Fluid Dynamics Meeting**, Passive rotation of a flapping wing with an inhomogeneous mass distribution

TEACHING EXPERIENCE

at University of Southern California

2021 Spring	**Teaching Assistant**, AME-526, Introduction to mathematical methods in engineering II, *Prof. Niema Pahlevan*
2020 Fall	**Teaching Assistant**, AME-404, Computational Solutions to Engineering Problems, *Prof. Takahiro Sakai*

GRADUATE COURSEWORK

at University of Southern California

2021	PHYS-516, Methods of Computational Physics, A , *Prof. Aiichiro Nakano*
	EE-556, Stochastic Systems and Reinforcement Learning, A , *Prof. Rahul Jain*
	CSCI-570, Analysis of Algorithms, B+ , *Prof. Victor Adamchik*
	AME-508, Machine Learning and Computational Physics, A , *Prof. Assad Oberai*
	CSCI-596, Scientific Computing and Visualization, A , *Prof. Aiichiro Nakano*
	class project: a C++ parallel reinforcement learning implementation *Github Link*
2020	AME-525, Engineering Analysis, A- ,*Prof. Eva Kanso*
	AME-526, Introduction to Mathematical Methods in Engineering II, A , *Prof. Niema Pahlevan*
	AME-511, Compressible Gas Dynamics, A , *Prof. Iván Bermejo-Moreno*
	PHYS-760, Selected Topics in Computational Physics, P , *Prof. Satish Kumar Thittamaranahalli*
	AME-451, Linear Control Systems I, A , *Prof. Henryk Flashner*
	AME-541, Linear Control Systems II, A- , *Prof. Néstor O. Pérez-Arancibia*
	AME-535A, Introduction to Computational Fluid Mechanics, A , *Prof. Alejandra Uranga*
	AME-530A, Dynamics of Incompressible Fluids, B+ , *Prof. Carlos Pantano*

HONOR/AWARDS

2017-2018	Hui-Chun Chin and Tsung-Dao Lee Chinese Undergraduate Research Endowment of SJTU
2016	Honeywell Star Project
	Second Place , Parts of the National College Students Physics Competition
	Third Place , Chinese College Students' Mathematics Competition
2014	**First Place**, Chinese Chemistry Olympiad
	First Place, Shanghai Adolescents Science and Technology Innovation Contest

ONLINE COURSEWORK

at Udacity

2022	C++ Nanodegree

at Coursera

2021	Build a Modern Computer from First Principles: From Nand to Tetris (Project-Centered Course), Hebrew University of Jerusalem
2019	**Specialization**, DeepLearning.AI TensorFlow Developer , DeepLearning.AI (containing 4 courses)
	Specialization, Deep Learning, DeepLearning.AI (containing 5 courses)
	Machine Learning, Stanford University,
2014	General Chemistry, Peking University

TECHNICAL SKILLS

Programming Language:	Python, Matlab, Fortran, C/C++ (from more familiar to less, same below)
Machine learning framework:	Pytorch, Tensorflow
Hardware:	Arduino, Raspberry Pi