Mr. Songrui(Ryan) LI

Contact Information

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Research Interests

My interests include leveraging machine learning algorithms for modeling dynamical systems, such as data-driven surrogate models and physics-informed neural networks. Additionally, I have a keen interest in GPU-based high-performance computing.

Vocational Experience

SAIC Volkswagen Automotive Co., Ltd., China

Data&Connectivity Group, Data Science Engineer (Rotational Position) **6/2023 - Present**

- Participated in the quality assurance of vehicle-end data
- Participated in data-driven automotive predictive maintenance development

Pre-R&D Group, CFD Research Engineer **5/2021 - Present**

- Second-developed and validated DualSPHysics, an open-source CUDA-based SPH solver
- Developed a data-processing software for automotive soiling tests using image segmentation
- Performed the calibrations of optimized solvers and tools for OpenFOAM

Education Background

M.Sc., Advanced Computational Methods for Aeronautics, Flow Management and Fluid-Structure Interaction

Department of Aeronautics, Imperial College London, UK **9/2019 - 11/2020**

- Grade: 74.3/100, Merit
- Key modules: Computational Fluid Dynamics, High-Performance Computing, Introduce to Flow Control, Hydrodynamic Stability, Separated Flows and Aeroservoelasticity, etc.

B.Eng., Flight Vehicle Propulsion Engineering

School of Aeronautics, Polytechnic University of Madrid, Spain **01/2019-07/2019**

- Exchange student for final individual project

School of Power and Energy, Northwestern Polytechnical University, China **09/2015-01/2019**

- Grade: 86.5/100, 14 out of 263
- Key modules: Fundamentals of Gas Dynamics, Fluid Mechanics, Heat Transfer, Mechanical theory, Turbo-machinery, etc.

Pre-university Qualification: Total Score of NCEE (GaoKao): 619/750 (First Tier Line, 483)

Honors and Awards

Erasmus+ International Credit Mobility Scholarship(KA107), NO.2017-1-ES01-KA107-036986, European Union, 2/2019-6/2019

International Summer School Scholarship, Faculty of Mechanical Engineering, University of Southern Denmark, 8/2018, 12 in total

Outstanding Student of Academic Year 2016-2017, School of Power and Energy, Northwestern Polytechnical University, 12/2017, 5 out of 263

Outstanding Student of Academic Year 2015-2016, Northwestern Polytechnical University, 12/2016, 5 out of 263

Third-level Prize of WU Yajun Special Scholarship, Northwestern Polytechnical University, 12/2016, 10 out of 6390

Third Prize in the Seventeenth College Students Mathematical Contest in Modeling, Northwestern Polytechnical University, 06/2016, 30 out of 100

Academic Experience

Bifurcation and Oscillation Effects of Gyrotactic Swimming Microorganism Suspension in Vertical Pipe (Individual)

Imperial College London MS.c Individual Project **05/2020-10/2020**

Director: Dr. Yongyun Hwang

- Developed a semi-implicit finite volume solver for microorganism suspensions
- Analysed downflow bifurcations with flow rate and pressure gradient respectively
- Discovered new bifurcations and instabilities under pulsatile flow regimes

Flow Field Analysis Based on RANS Solver and BiGlobal Stability Theory (Individual)

Undergraduate Graduation Project & Erasmus+ Scholarship Programme **02/2019-06/2019**

Directors: Professor Eusebio Valero Sanchez & Associate Professor Yaguo Lyu

- Performed Strouhal number validation and stability analysis of vortex shedding from a cylinder
- Discovered the dominant eigenmode of the NACA0012 airfoil under critical angle of attack
- Attempted biGlobal stability analysis for transonic round/straight trailing edged injectors

Optimisation of a Wind Turbine Airfoil Prototype (participant)

International Summer school: Experimental Fluid Mechanics Group Project **8/2018**

Faculty of Mechanical Engineering, University of Southern Denmark

- Introduced effective vortex generators to a wind turbine airfoil
- Carried out related wind tunnel and water channel PIV tests
- Visited the *LM Wind Power* Test and Validation Centre

Design Research on a Bionic Anti-drag Propeller (project manager)

China college students "Internet+" Innovation Competition **04/2017-04/2018**

Ministry of Education, China

Director: Professor Yangang Wang

- Proposed and designed a novel UAV propeller with a serrated leading edge
- Led the group through 3D modeling, CFD simulations, and data analysis

Starting Test of a Pulse Jet Engine(participant)

Scientific Research Practice Program **07/2017-08/2017**

Director: Professor Hong Yan

- Set up the experiment platform
- Measured the thrust and pressure pulse frequency of a valveless pulse engine

Computer Skills

Computer Languages: C++, Python, MATLAB

Open-source Software & APIs: OpenFOAM, DualSPHysic, CUDA, PyTorch

Commercial Software: ANSA, CATIA, STAR-CCM+