ZIWEN HU

CFD engineer, 2012 Laboratories, Huawei Technologies CO LTD, China
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EDUCATION BACKGROUNDS

University of Tokyo — Sept. 2019 - Sept. 2021
Master of Mechanical Engineering, Micro Energy System Lab — Tokyo, Japan

- GPA: 3.75/4.0
- Major course: Micro Thermal and Fluid System (A), Advanced Thermal and Fluids Engineering (A), Complex Fluid System Modeling (A), Parallel Numerical Computation (A)
- Honors/Awards: JASSO scholarship (2019 - 2020)

Huazhong University of Science and Technology — Sept. 2015 - June 2019
Bachelor of Engineering, School of Energy and Power Engineering — Wuhan, China

- GPA: 3.81/4.0
- Major course: Engineering Thermodynamics (4.0), Engineering Heat Transfer (4.0), Fluid Mechanics (4.0)
- Honors/Awards: CSC scholarship (2017)

University of Michigan - Dearborn — Aug. 2017 - Dec. 2017
Exchange student, Department of Mechanical Engineering — Dearborn, MI, USA

- Major course: Machine Design (A), Thermodynamics (A)
- Honors/Awards: UMich - HUST scholarship (2017)

WORKING EXPERIENCE

Huawei Technologies CO LTD — Oct. 2021 - Present
CFD software engineer, 2012 Laboratories — Songshan Lake, China

- Participate in a development project of a domestic CFD software as the product manager to replace the use of ANSYS Fluent, in cooperating with the state key Laboratory of Turbulence and Complex System (LTCS) in Peking University and Shenzhen Tenfong Technologies CO LTD.
- Collect the CFD simulation needs from thermal and fan department in Huawei and form the demand schedule for software developing.
- Develop and/or optimize the software function including simulation of turbulent flow, multiphase flow, radiation, dynamic grids, rotating machine, porous medium and aerodynamics noise.
- Conduct research on the shape optimization of fan blade and achieve the function in the software by developing a interface with Optimus.
- Design the function of applying machine learning and data mining in turbulent model parameter optimization, using DNS and experimental data.

RESAERCH EXPERIANCE

Meshless Shape Optimization Approach in Conjugate Heat Transfer Problems with Complex Geometry
Master Thesis — Sept. 2019 - Sept 2021

- Develop a strong meshless collocation method using C language, conducting thermal and fluid dynamics analysis towards convection heat transfer and conjugate heat transfer process for multiple benchmark problems.
- Discretize the problem domain using a bubble-generation method via: 1) initialize the bubble distribution by placing bubble on the edges and inside problem domain equidistantly; 2) Define a inter-bubble force similar to the Van del Waals force to control the distance between bubbles and reach a dynamic stable state; 3) Control the population of bubbles by adding or removing bubbles depending on a special-designed overlapping ratio; 4) keep integrating to reach the final bubble distribution; 5) use the centers of the bubbles as discretized nodes.
- Propose an adjoint-based shape optimization method to maximize the overall heat dissipation performance via optimizing the fin shape by deriving the physical, perturbation and adjoint field and designing a special cost

functional (illustrated in details in the following part).

- Use MPI parallel computation (OpenMPI) in the supercomputer system Oakbridge-CX environment to accelerate the simulation process using multiple nodes DMP.

Shape Optimization of Foldable Heat Sink using Graphene Sheet

Research Assistant Sept. 2020 - April. 2021

- Apply the above-mentioned algorithm in the shape design to optimize the thermal performance of a foldable heat sink made of graphene sheet.
- Design a cost functional consisting of heat storage of both sink and surrounding fluid field, augmented by adding the volume and time integral of the governing equations multiplied by adjoint variables.
- Derive the special thermal coupling condition for all three fields and use it to get the final interface normal deformation by ensuring the positive increase of the cost functional.
- Use the moving least square method to interpolate the interface profile after each circle of shape optimization.

The Application of Artificial Intelligence in Image Object Recognition

Undergraduate Graduation Project Aug. 2018 - May 2019

- Conduct a survey and summarize the existing deep learning algorithm, dataset and framework in the field of image object recognition.
- Trained a Tensorflow-based neural network using INRIA Person and KITTI as pedestrian and vehicle training sets.
- Built a visualized interface using Tkinter module using GUI programming with Python

Simulation of the thermal protection system of hypersonic aircraft

Course project Sept. 2017 - Oct. 2017

- Simplify the thermal protection system model of NASA X43A hypersonic aircraft to simulate the temperature field inside and near the top edge of the aircraft using MATLAB.
- Simulate the performance of the thermal protection in different working medium situations and choose the best cooling scheme.

CONFERENCE

Fujioka Masahiro, Hu Ziwen, Kenichi Morimoto, Proposal of foldable heat sink using graphene sheet, the 58th Japanese Heat Transfer Symposium, Online, BPA1435, 2021.05.25 - 2021.05.27

PROFESSIONAL SKILLS

Programming and Computation: C/C++, Python, MPI parallel computing, Linux operation
Software: ANSYS Fluent, Star CCM+, COMSOL Multiphysics, OpenFOAM
Language: English (TOEFL iBT 103: R/L/S/W 29/26/22/26), Japanese (basic communication), Chinese (native speaker)
GRE: V 152 + Q 170 + W 3.5

REFERENCES

Prof. Yuji Suzuki
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Prof. Kenichi Morimoto
Lecturer, Department of Mechanical Engineering, University of Tokyo
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