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Ziheng Wu

EDUCATION BACKGROUND

Beihang University, Beijing *Sep 2021- Jan 2024*

- AECT combustion group, Research Institute of Aero-Engine.
- Co-supervised by Prof. Chi Zhang and Prof. Bosen Wang.
- MSc of Power Engineering and Engineering Thermophysics.
- GPA: 3.65/4.00, Postgraduate Recommendation.

Harbin Engineering University, Harbin *Sep 2017-Jun 2021*

- College of Power and Energy Engineering.
- Academic Mentor: Prof. Long Liu.
- BEng of Energy and Power Engineering.
- Average Score: 88.25, Comprehensive Ranking: 11/215 (5%).

WORKING EXPERIENCE

Peking University, Beijing *Jan 2024-Present*

- Research assistant**,** AI for Thermofluid Physics Lab.
- Supervised by Prof. Zhi Chen

PUBLICATIONS

1. **DeepFlame: An open-source platform for reacting flow simulations empowered by deep learning and high-performance computing** | *pdf* | *paper*
   MAO Run-ze, ***WU Zi-heng****, XU Jia-yang, Zhang Yan, CHEN Zhi*.*
   Computer Engineering & Science
   - An open-source platform, which supports machine learning libraries, algorithms during the simulation of reacting flows. The platform achieved a maximum speedup of up to 15 times when simulated a reactive Taylor Green Vortex (TGV).
2. **DeepFlame 2.0: A new version for fully GPU-native machine learning accelerated reacting flow simulations under low-Mach conditions** | *pdf* | *paper*
   Runze Mao, Xinyu Dong, Xuan Bai, ***Ziheng Wu****, Guanlin Dang, Han Li, Zhi X. Chen*.*
   Computer Physics Communications
   - The latest version of DeepFlame has ported and optimized all computational tasks for high-performance GPU hardware.

RESEARCH EXPERIENCES

Prediction Method of Outlet Temperature Distribution of Combustor *Sept 2022-Nov 2023*

Master's Thesis and a part of National Science and Technology Major Project (J2019-III-0014-0057)

- Developed a Method to model the spatial distribution of mixture fraction, progress variables and temperature of the swirl combustion zone of the combustor.
- Coupled the developed model with temperature prediction model of the mixing zone to achieve the function of combustor outlet temperature distribution prediction.
- Applied AI to improve the generalization and practicality of the prediction method.

The DNS Research of Ammonia/Air Premixed Jet Flame *Jan 2024-Present*

Major work in the period of research assistant

- A direct numerical simulation (DNS) of an ammonia/air premixed flame of the LUPJ burner is conducted to research flame/turbulence interaction at high Karlovitz numbers.
- The DNS simulation case (on the supercomputer Fugaku) consists of 180 million cells and is performed on the DeepFlame simulation platform.
- Benefited from the smaller scale of DNS simulation the more details of the flame/turbulence interaction were showed.

The Large Eddy simulation of Sandia D Flame ***Sep 2024-Present***

A part of work in the period of research assistant

- The Large Eddy simulation of Sandia D Flame was performed on GPU codes and CPU codes of Deepflame separately. Both of the simulation results achieved the great agreement with experimental data.

The Large Eddy simulation of spray flame stabilized by dual-bluff-body ***Sep 2024-Present***

A part of work in the period of research assistant

- Three Large Eddy simulations of spray flame stabilized by dual-bluff-body were performed on CPU codes of Deepflame. The flame behaviors captured the simulation results are highly consistent with experimental results.

PATENTS AND SOFTWARE COPYRIGHTS

Combustion chamber using venturi to inject fuel

*H. Xiao, **W. Ziheng**, L. Yuzhen, Z. Chi* *Patent No. CN 115234942 A, Priority No. 202210752115 .0*

Method and Device for Prediction the Temperature Distribution of the Main Combustion Zone

*Z. Chi, **W. Ziheng**, W. Bosen, Z. Guangyan* *Patent No. CN117829020 A, Priority No.202311857130.2*

Aircraft Engine Combustion Chamber Design Software Based on Exit Temperature Control V1.0

*Z. Chi, **W. Ziheng**, Z. Guangyan, W. Bosen* *Application No.2024R11S2146156, Certificate No.14245230*

COMPETITION EXPERIENCES

National Energy Conservation and Emission Reduction Competition, **Third Prize** (**First Author**) **2019**

- Led project planning, was responsible for the electronic control system, coding, and machine assembly.

HONORS AND AWARDS

Merit student of Beihang University **2023**

Outstanding student cadre of Beihang University **2022**

Outstanding graduate student of Beihang University **2022**

Master's Degree Graduate New Student Scholarship (**12/140**) **2021**

Outstanding Graduate of Harbin Engineering University **2021**

CCS Scholarship (**2/215**) **2018**

Harbin Engineering University Scholarship, **First Prize** & **Second Prize** **2018&2019**

The 2018 Heilongjiang Province University Rugby Championship, **Third Place** (Sports) **2018**

SKIllS

Programming Skills

- MATLAB, C++, Python

English Proficiency

- IELTS: 6, CET 6: 452, CET 4: 565

Design Skills

- UG, Solidworks

AECT WeChat public account Management

- Edits pushes with over 100 thousands views