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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

*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 and algorithms during the simulation of reacting flows.
- Successfully employed deep neural networks (DNNs) to compute chemical reaction source terms.
- Implement the solution of partial differential equations and the construction of discrete sparse matrices on GPUs based on the Nvidia AmgX library.
- Based on the GPU codes for full process of reacting flows calculation, we achieved a maximum speedup of up to 15 times when simulating a reactive Taylor Green Vortex (TGV).

## 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 experiment.

## **PATENTS AND SOFTWARE COPY RIGHTS**

### **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**

- CET 6: 452, CET 4: 565

### **Design Skills**

- UG, Solidworks

### **AECT WeChat public account Management**

- Edits pushes with over 100 thousands views