Research Fellow Position in Multiphase CFD- group of Assoc. Prof. Bo Kong (RF-2019005)

Description
The Chemical Engineering Program (the group of Bo Kong) is looking for one scientist to lead computational research projects in multiphase CFD related to multiphase chemical reaction engineering. Contract duration: 3 years.

Project Details
The high impact of computational fluid dynamics (CFD) in the industry has been well demonstrated in its wide adoption in industries, such as aerospace and automobile. With the advance of modern computers and the increasing affordability of computing power they provide, conducting numerical experiments through modeling and simulations becomes a more and more attractive alternative to the expensive pilot scale physical experiments in engineering practice. In many cases, especially for single-phase flow, it has become a common practice to directly utilizing CFD to test, optimize, and scale-up different application designs. Nevertheless, CFD software for multiphase flows are far from mature, especially when involving with mass and heat transfer and chemical reactions, and many critical research issues remain before they can be routinely and confidently employed for engineering purposes, especially in the chemical, oil/gas, pharmaceutical, and food industries.

In this project, the postdoc scholar will be responsible for developing and enhancing our current numerical tools for doing such simulations and conducting various CFD simulation projects for multiphase flows, such as gas-solid, gas-liquid, and liquid-liquid flows. The research effort aims to significantly improve the accuracy and efficiency of the numerical tools for conducting multiphase flow simulations and to use these tools to ultimately enhance the design and operation of multiphase flow-related chemical engineering processes. These efforts will be carried out in concert with physical experiments being carried out within our group, to both validate the multiphase flow models and to speed up the design and optimization of various chemical reactors. The successful candidate will possess the ability to plan, initiate, and execute research activities related to numerical modeling in the project. The ability to interact and brainstorm with the experimental scientists within the team is essential to success in the position. For further details of the research projects, please contact Prof. Kong.

Duties and Responsibilities
1. Research 70%

Develop and implement new models and CFD codes to further enhance the modeling and simulation capabilities. Effectively transform the engineering ideas and designs into CFD simulation test cases. Proposing new ways of using modeling and simulations to improve efficiency of various multiphase reactors. Develop geometry, mesh, and case setup quickly and accurately, post-process the simulations data into pictures and animations, communicate the results effectively to the experimental team.

2. Writing 20%

Co-author, with group members, articles for publication and presentations. Present scientific data at professional meetings. Help to draft proposals for funding

Program
Chemical Engineering Program

Research Area
Multiphase CFD

Contacts

Assoc. Prof. Bo Kong

Email: bo.kong@gtiit.edu.cn

Webpage Link

Application Deadline
Continuous till filled

Date Posted
10, Oct., 2019

opportunities with principal investigators.

3. Safety and Training 5%

Ensure all relevant safety and policies and procedures are followed. Complete the required safety and compliance training.

4. Other duties as assigned 5%

Other duties are assigned, including mentoring of graduate students within the group and professional developments.

Keywords
Multiphase Flow, Computational Fluid Dynamics, Gas-solid, Gas-liquid, Liquid-liquid flows, Population balance, Basilisk, OpenFOAM

Selection Criteria
- PhD degree in Chemical/Mechanical/Aerospace Engineering (essential)

- Strong background in multiphase flow modeling and simulations (essential)

- Experience of developing and implementing new CFD models necessary for the different aspects of multiphase flow simulations in both in-house or open-sourced software, in C++ or Fortran. (essential)

- Experience of using and developing OpenFOAM, and/or Basilisk (essential)

- Experience of popular geometry building, meshing, visualization software, such as FreeCAD, GMSH, Salome, snappyHexMesh, Visit, and Paraview (highly desired)

- Experience/skills of managing and performing many large-scale simulations on high-performance clusters (highly desired)

- Publications related to multiphase flows and computational physics (desired)

- Highly self-motivated and able to work independently with minimal supervision(desired)

Benefits
- Salary range: up to $49,020 / year (depending on qualifications of the candidate)

- Subsidized housing at GTIIT, China

- Health insurance: regular cover for Chinese citizens or private health insurance for foreigners

- Professional conference travel allowance

Application
- Application deadline: **Continuous till filled**

- Send below required documents electronically to: bo.kong@gtiit.edu.cn

1. Curriculum vitae and personal statements
2. A publication list
3. Three letters of recommendation (one from the mentor for PhD and/or Master's studies)

4. A short research plan outline (up to one page in length)
5. Degree certificates with certified English translation for both the PhD and Master's degrees