香港科技大學
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND
ENVIRONMENTAL ENGINEERING

SEMINAR

A FULL-PROCESS GPU-ACCELERATED FRAMEWORK FOR COUPLED CFD-DEM

Speaker

Dr. Tao YU

Founder, TFluid Technology Co., Ltd.

Abstract

GPU parallel computing and artificial intelligence (AI) are crucial tools for enhancing computational fluid dynamics (CFD) simulations. GPU parallel computing not only improves performance but also ensures greater computational accuracy. Unlike the traditional finite volume method (FVM) algorithm designed for CPU parallelism, the FVM algorithm for GPU parallelism requires specific optimizations in its underlying architecture to align with GPU computing characteristics. This seminar will use the full-process GPU-accelerated FVM-DEM software TFluid as a case study, demonstrating its superior computing speeds and reduced hardware costs. Detailed comparisons with well-known open-source software, such as OpenFOAM and CFDEM, will be provided, along with an in-depth introduction to the underlying GPU parallel algorithms and related case analyses.

Biography

Dr. Tao Yu earned his Ph.D. from the Hong Kong University of Science and Technology. His research focuses on developing advanced numerical methods and algorithms for computational fluid dynamics (CFD) and CFD-DEM coupling in multi-physics simulations for key engineering applications, including additive manufacturing. He is the sole developer of TFluid, a state-of-the-art, full-process GPU-accelerated CFD-DEM simulation software, for which he holds an invention patent and software copyright. His expertise is well recognized through his publications in top journals such as CMAME and Additive Manufacturing. Dr. Yu has also served as a Senior Algorithm Engineer at Linctex Technology and as a Simulation Researcher at Boea-wisdom Technology.

3 October 2024
Thursday

3:00 pm - 4:00 pm

Civil Engineering Conference Room Room 3574 (Lift 27/28) HKUST

Enquiry:

Ms. Rebecca Yau/ Mr Edmond Yip
cerebeca@ust.hk / cekcyip@ust.hk