

Prof. Gavin Tabor

Prof. Tabor's research is on the computational simulation of fluid flows, using both physics-based methods (Computational Fluid Dynamics or CFD) and also Machine Learning (ML) approaches. He is a professor of Computational Fluid Dynamics, Department of Engineering, Faculty of Environment, Science and Economy, University of Exeter, UK. He has spent nearly 30 years working in CFD, both on fundamentals of the subject such as turbulence modelling, and also its application in a wide range of engineering and other disciplines, recently including offshore marine renewable energy, sustainable urban drainage, and biomechanics. He is a significant contributor to the OpenFOAM community, as Chair of the Joint Technical Committees for the OpenFOAM Governance project and member of the OpenFOAM Workshop international committee; he is also involved with the Isambard Tier 2 HPC project and the CCP-WSI+ collaboration on Wave-Structure Interaction. In addition to his work on CFD he is also involved in research on optimisation using Bayesian Machine Learning, and also on other applications of ML such as for fault detection and plasma simulation. He is the author of more than 80 journal papers across the full range of the work described here.



Keynote Presentation 12

Making Waves; OpenFOAM and Offshore Hydrodynamic Simulation

Since its release as an open source code in 2004, OpenFOAM has grown to be probably the most used CFD code in both academia and industry. One area in which it has had the most impact has been in free surface modelling, particularly using the Volume of Fluid methodology, and its application in areas such as offshore renewables, offshore structural engineering and marine engineering. In my keynote, I will discuss a number of projects I am involved in which are of significance for the OpenFOAM project. These include the Governance structure set up by OpenCFD to bring the OpenFOAM community together and link developers and code users; the CCP-WSI+ collaborative project on Wave-Structure Interaction; and the Isambard Tier-2 HPC machine; both these being UK-EPSCRC funded initiatives with OpenFOAM at the core. I will also look to the future and talk about how CMH may develop with Machine Learning and

Data Science- based tools becoming more developed as part of our simulation toolkit.