

# OpenFOAM & Combustion Simulation



## Active Flow Control via Deep Reinforcement Learning Implemented in OpenFOAM

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Host: Dr. Shangpeng Li (National University of Singapore)

Register: [https://nus-sg.zoom.us/webinar/register/WN\\_JHi0MIgRQe-CAiw-WgOLvA](https://nus-sg.zoom.us/webinar/register/WN_JHi0MIgRQe-CAiw-WgOLvA)



### Abstract

This talk provides a general overview of possibilities to combine computational fluid dynamics (CFD) and machine learning (ML). After a few examples from the ML sub-fields of supervised and unsupervised learning, the talk focuses on the application of deep reinforcement learning (DRL) to solve flow control problems. After a brief introduction to fundamental concepts of DRL, the practical implementation of a typical benchmark case in OpenFOAM and PyTorch is described in detail. The talk closes with an overview of current developments in DRL and discusses future applications.

### About the Speaker

Dr. Andre Weiner is a post-doctoral researcher at the Institute of Fluid Mechanics at the Technical University of Braunschweig, Germany. He obtained his Ph.D. from the Technical University of Darmstadt, where he worked on data-driven boundary layer models for reactive mass transfer processes in multiphase flows. His current research focuses on computational methods for dimensionality reduction, enhancing fluid dynamics simulations with machine learning, and the management and reproducibility of scientific data.

