

Stanford FLAME AI Workshop 2024

Future Learning Approaches for Modeling and Engineering

Dates: Sept. 23 to Oct. 18 2024 | Venue: Virtual [<https://flame-ai-workshop.github.io/>]

Contact: flame.ai.workshop@gmail.com

Mission

To foster a dynamic forum for exchanging ideas, cutting-edge data, advanced methods, and models related to ML techniques for fluid dynamics, turbulence, and environmental science - fields applications that are crucial to the development of energy, climate resilience, wildfire mitigation and safety systems.

Agenda

1. A **20-day-long ML challenge** (involving 1-2 person(s) per team) will be held to tackle temporal modeling in fluid dynamics/turbulence with open-source data.
 - Prize: GPU credits, and leading teams will be invited towards a joint publication.
2. **10 one-hour-long talks** (1 per day) on cutting-edge trends will be given by AI/ML experts within Stanford, academic guests, and industry partners from the Greater Silicon Valley ecosystem. Topics:

Fundamentals of data-driven tools



Classification vs. Regression. Open-source ML libraries (Torch, Tensorflow) and platforms (Kaggle). Best practices for training models.

AI for Science



Trends in data, benchmarks, and methods. Tools/platforms for ML-based scientific discovery. Foundation models for science.

Generative Machine Learning



Semi-supervised learning. Diffusion models. Reinforcement learning. GANs.

Physics-informed Machine Learning



Physics-informed loss and architecture. Data-centric vs. model-centric vs. knowledge-centric.

Eligibility Criteria

We invite Computational, Fluid Dynamics, Combustion, environmental or AI/ML researchers worldwide to join us at this virtual workshop. Sign up at <https://flame-ai-workshop.github.io/> for future info on the technical program.

Apply here:



Laboratory of **Fluids**
in **Complex** Environments

Lead organizers

Prof. Matthias Ihme (Stanford University, SLAC National Accelerator Laboratory), Bassem Akoush (Stanford University), Jen Zen Ho (Stanford University)

