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 - applications crucial to the development of sustainable energy solutions, climate resilience, wildfire mitigation, and safety systems

Agenda

1. A **four-week long ML challenge** (involving 1-2 person(s) per team) will be held to tackle ML-challenges in predicting spatio-temporal and dynamical processes in physical sciences, environmental flows, and engineering with open-source data.
    - Prize: GPU credits, and leading teams will be invited towards a joint publication.
2. **Invite talks and keynote lectures** 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.

Generative Machine Learning

Semi-supervised learning; Diffusion models; Reinforcement learning; Transformers; GANs; Recurrent method

AI/ML for Physical Science and Environment

Trends in data, benchmarks, and methods. Tools/platforms for ML-based scientific discovery. Foundation models for physical sciences, environment, and engineering.

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 and/or AI/ML researchers worldwide to join this virtual workshop. Sign up at https://flame-ai-workshop.github.io/ for future info on the technical program.

Apply here:

FLab | Stanford ENGINEERING | Laboratory of Fluids in Complex Environments

Lead organizers: Matthias Ihme, Bassem Akoush, Jen Zen Ho (Stanford University, https://fxlab.stanford.edu)