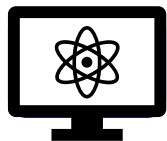


AFRL Regional Network Midwest Workshop

AI/Machine Learning: Gaussian Processes and Bayesian Optimization for Hydrocode Simulations

AI and machine learning approaches have become popular for “big data” problems. However, for complex multiphysics problems, both simulation and physical data are sparse. Multiphysics hydrocode simulations often involve a wealth of calibration parameters that must capture limited experimental data. Likewise, these simulations are computationally expensive such that trail-and-error parameter determination or optimal design is impractical. In fields ranging from energetics to shock physics, experiments are expensive and limited in number, thus, methods are needed to expand upon and calibrate to this limited data. Gaussian process regression, Bayesian optimization, and multi-fidelity predictions overcome these challenges and are covered in this workshop



Optimize large dimensional hydrocode simulations



Learn the workings of statistical based surrogate modeling with hands-on Python examples



Explore best practices (design, training, hyperparameters, etc) and discuss individualized applications and troubleshooting

August
26th - 27th, 2026

Doolittle Institute - Niceville, FL

Hosted by

Prof. John A Moore
(Marquette U.)

Dr. Michael Crochet
(AFRL Eglin)

Bring Your Own Example Problems!