Multi-Fidelity Fusion

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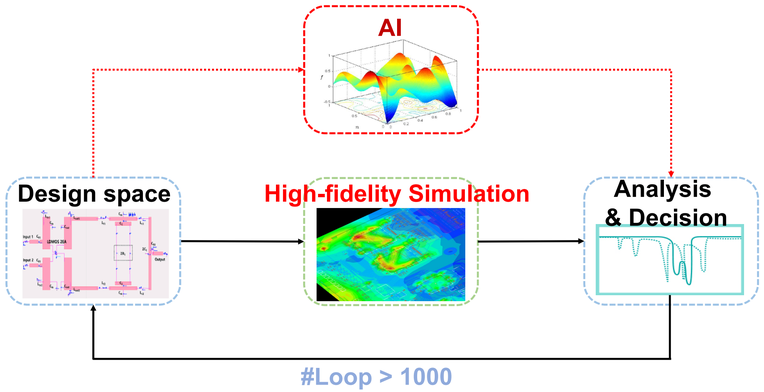
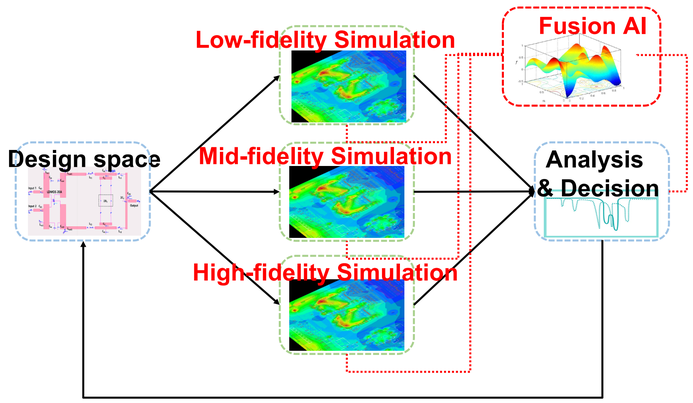
Single High Fidelity Only



Multi Fidelity Fusion

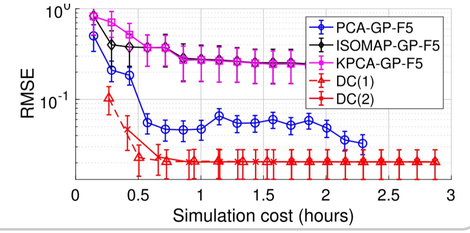


Why Fidelity Fusion?

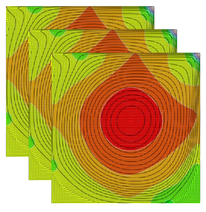
✓Less computational cost for data generation

✓Easier ML model training

✓Insight into model design

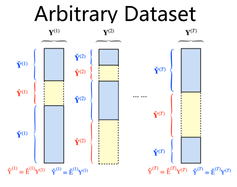


FidelityFusion: Our Out-of-the-box Solution

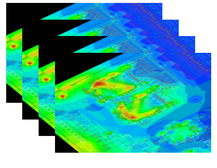


Deep Coregionalization
Nonlinear Autoregression for spatial-temporal Outputs
J. Computational physics

Residual Gaussian Process
Tractable Autoregression for spatial-temporal Outputs
J. Applied Mathematical Modelling

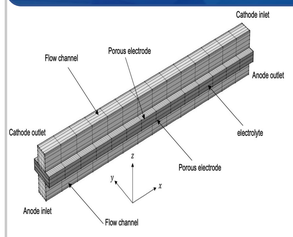


Generalized Autoregression
For almost all types of data (non-subset, different dimensionality, and QoI for different fidelity)
NeurIPS2022

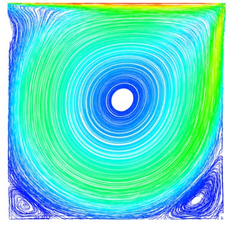


Infinite Fidelity Fusion
Applicable to problems with infinite fidelities
NeurIPS2023 (under review)

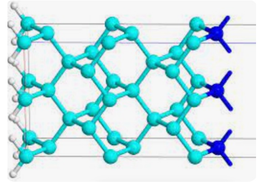
Applications and Case Studies



Multi-fidelity design optimization
For solid oxide fuel cells Design
Int. J. Hydrogen Energy



Multi-fidelity Bayesian optimization
For mechanical plate vibration design
IJCAI2020



Multi-fidelity Emulation
For fluid dynamics
AISTATS2021

Predicting GW results from DFT simulations
Electronic structure calculation prediction

All Codes Available: https://github.com/IceLab-X/FidelityFusion
More about us: wxing.me. We look forwards to all collaborations.

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