Physics Informed Machine Learning

Steve Brunton

1. Physics Informed Machine Learning High Level Overview of AI and ML in Science and Engineering
2. AI/ML + Physics 1: Choosing what to model
3. AI/ML + Physics 2: Curating Training Data
4. AI/ML + Physics 3: Designing an Architecture
5. AI/ML + Physics 4: Crafting a Loss Function
6. AI/ML + Physics 5: Employing an Optimization Algorithm
7. AI/ML + Physics: Recap and Summary
8. AI/ML + Physics: Preview of Upcoming Modules and Bootcamps
9. Deep Learning to Discover Coordinates for Dynamics: Autoencoders & Physics Informed Machine Learning
10. Sparse Identification of Nonlinear Dynamics (SINDy): Sparse Machine Learning Models 5 Years Later!
11. Sparse Nonlinear Dynamics Models with SINDy 2: Training Data & Disambiguating Models
12. Sparse Nonlinear Dynamics Models with SINDy 3: Effective Coordinates for Parsimonious Models
13. Sparse Nonlinear Dynamics Models with SINDy 4: The Library of Candidate Nonlinearities
14. Sparse Nonlinear Dynamics Models with SINDy 5: The Optimization Algorithms
15. Discrepancy Modeling with Physics Informed Machine Learning
16. Hamiltonian Neural Networks (HNN)
17. Lagrangian Neural Network (LNN)
18. Neural Implicit Flow (NIF)
19. Neural ODEs (NODEs)   NODEA
20. Python Symbolic Regression (PySR)

Supplementary Materials

November 8, 2025