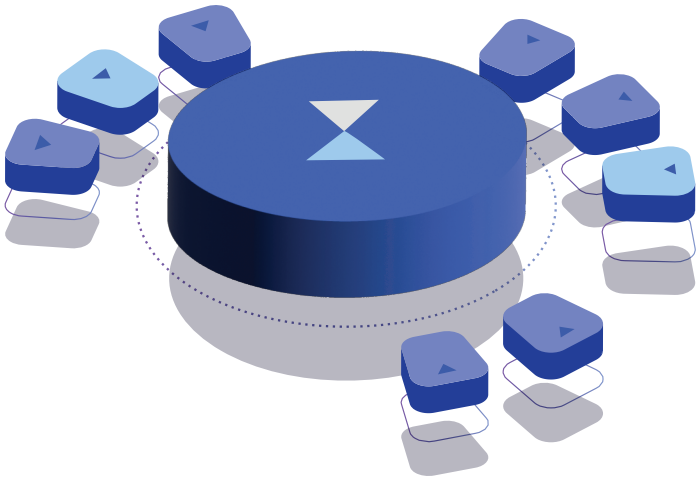
Julia SIM

JuliaSim Digital Echo

Accelerating Surrogates



JuliaSim's proprietary new architecture, the Digital Echo, automatically adjusts its training based on the complexity of the model to improve the ability to accurately produce neural surrogates of dynamical systems.

Digital Echo has verification and validation tooling to make it easy to analyze the accuracy of the trained surrogate, taming the complex of machine learning and allowing the engineer to understand the resulting trade-off between precision and performance. The resulting surrogates are represented as components with Julia's ModelingToolkit acausal modeling system. This ecosystem has tooling for generating FMUs of the trained surrogate models that can be imported into other modeling systems like Modelica and Simulink.

Digital Echo tooling pairs with the JuliaSim Model Optimizer to enable the use of the generated surrogates to do fast calibration of model parameters to data, perform high-level design optimizations, and more with local (derivative-based) and global optimization techniques.

The Digital Echo tooling connects with the JuliaSim Control library to enable control analysis on the resulting surrogate, along with allowing one to generate surrogates of Model-Predictive Controllers (MPC).