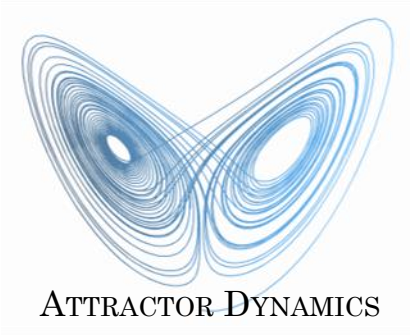

Attractor Dynamics

Real World Extreme Events

$$\frac{dx}{dt} = \phi(x, y) \qquad \frac{dy}{dt} = \psi(x, y)$$

$x(t)$ $y(t)$

$x_e(t)$ $y_e(t)$

Zeroth Derivative $x(t)$

First Derivative $x'(t)$

Second Derivative $x''(t)$

Physics Motivated Loss Fuction

$$\mathfrak{L}_1 = \sqrt[2]{\frac{\sum_n (\mathfrak{x}_{predicted} - \mathfrak{x}_{real})^2}{n}}$$

Transfer Learning

Zeroth Derivative $x_e(t)$

First Derivative $x'_e(t)$

Second Derivative $x''_e(t)$

Physics Motivated Loss Fuction

$$\mathfrak{L}_2 = \sqrt[2]{\frac{\sum_n (\mathfrak{y}_{predicted} - \mathfrak{y}_{real})^2}{n}}$$

Forecasted Zeroth Derivative $x(t+1)$

Forecasted First Derivative $x'(t+1)$

Forecasted Second Derivative $x''(t+1)$

Forecasted Zeroth Derivative $x_e(t+1)$

Forecasted First Derivative $x'_e(t+1)$

Forecasted Second Derivative $x''_e(t+1)$

Pre Training Phase

Training Phase