1 The Koopman Operator

Koopman operators consist on a dimension lifting technique that allows us to model a Finite-Dimension Nonlinear Dynamical System with an Infinite-Dimension Linear Dynamical System.

Koopman operators provide a convenient framework where traditional, more mature and optimized Linear System Identification and Control tools can be applied. In contrast with conventional linearization methods that depend on local gradients, the Koopman operator provides an exact description (at least in theory) of the System's Dynamics and, more importantly from the Applied Controls point of view, it is easily adaptable to a fully data-driven pipeline, provided we have access to the internal states of the System of interest (gray-box framework).