

Data-driven modeling of dynamical systems in the frequency domain

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This tutorial will start by motivating frequency-domain modelling. The presentation will focus on the Loewner framework as the main tool for data-driven modeling in the frequency domain. The Loewner matrix will be introduced through the barycentric form of a rational interpolant, while the introduction of the shifted Loewner matrix will allow for a straightforward (almost no computation) descriptor-form representation of the transfer function of the dynamical system from which measurement data was obtained. One of the main advantages of this framework is the reduced computational cost for tackling MIMO systems with a large number of inputs and outputs. The tutorial will conclude with a brief presentation of the extension to parametric systems