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MOOSE

MOdel based Optimal input Signal dEsign Toolbox

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What is MOOSE?

MOOSE is a model based optimal input design toolbox developed for Matlab.

What does MOOSE do?

MOOSE solves optimization problems common in experiment design in system identification for control.

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Optimal input design problems

Objective:

Find an input signal that minimizes the cost related to the system identification experiment.

Constraint:

A specified control performance is guaranteed when using the estimated model in the control design.

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Optimal input design problems (cont.)

Optimization problem:

$$\begin{aligned} \underset{\Phi_u}{\text{minimize}} \quad & f_{cost}(\Phi_u) \\ \text{subject to} \quad & \mathcal{E}_{SI}(\alpha) \subseteq \Theta_{app}(\gamma) \\ & 0 \leq \Phi_u(\omega), \quad \forall\, \omega \end{aligned}$$

Can be approximated as a convex problem and solved in MOOSE.

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Features of MOOSE

- design of input spectrum, $\Phi_u(\omega)$.
- applications oriented design.
- classical input design, such as D-optimal.

- compatibility with Matlab Control System Toolbox.
- easy-to-use text interface.

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