

OF TECHNOLOGY

ROYAL INSTITUTE

MOdel based Optimal input Signal dEsign Toolbox (version 2: function- and YALMIP-based)

MOOSE2

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MOOSE2 is a MATLAB toolbox for solving applications-oriented input design problems. MOOSE2 designs the spectrum of the input signal used in the identification experiments.

Input design

Objective:

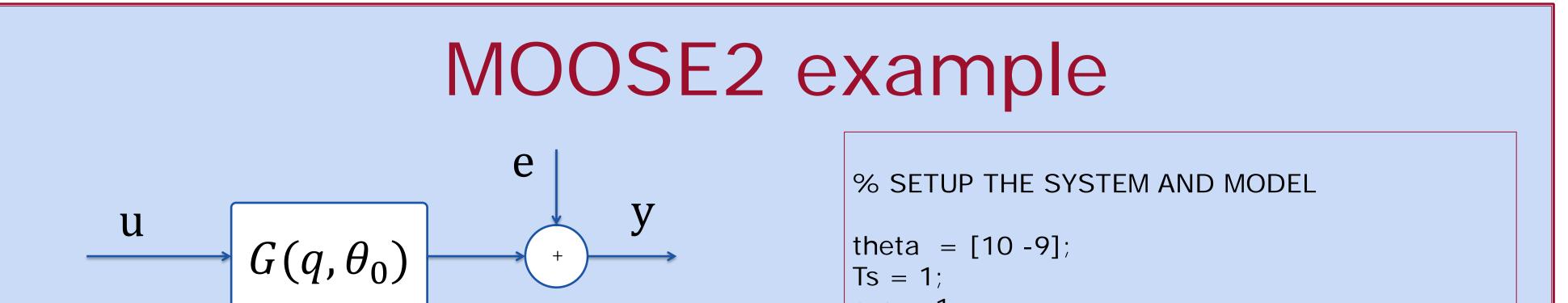
Find input spectrum that minimizes experiment cost

Constraint:

Guarantee that application and quality constraints on the model are satisfied along with any spectra constraints

Key features

- MATLAB-based
- Solves optimization problems via YALMIP
- Function-based interface, including dedicated functions for
 - Application constraints
 - Quality constraints
 - Spectrum constraints



CONTACT INFORMATION

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MOOSE2

- Minimize input variance
- Satisfy application constraint
- FIR input spectrum with 20 lags

 $E\{u^2\}$ minimize $\Phi_u(\omega)$ subject to $\varepsilon_{SI}(0.95) \subseteq \Theta_{app}(100)$ $\Phi_u(\omega) \geq 0, \forall \omega$

 $r_e = 1;$ model = idpoly(1,theta,1,1,1,r_e,Ts);

% INPUT DESIGN USING MOOSE2

problem = oidProblem(model, 200, 'FIR', 20); problem.constraints $\{1\}$ = oidApplicationConstraint(VappBiss, 100, 0.95); optH = solve(problem, [1 0 0]);

% GENERATE INPUT SIGNAL

u = Isim(optH, randn(200, 1));

Future work:

- Support for more spectrum types
- Controller design
- Support of signal constraints in time domain
- Toolbox directly connected to optimization solver