ROYAL INSTITUTE OF TECHNOLOGY

MOOSE

MOdel based **O**ptimal input **S**ignal d**E**sign Toolbox

Mariette Annergren
Christian A. Larsson

www.ee.kth.se/moose

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 input design.

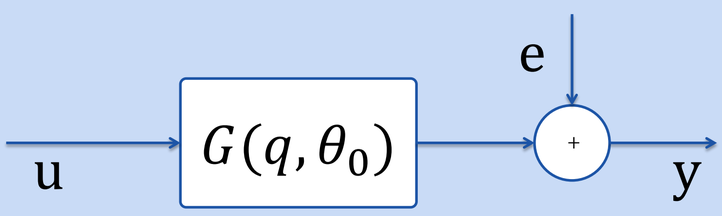
Key Features

- Easy to use interface
- Matlab compatible
- Available for free
- Full MIMO support
- Applications oriented input design
- Classical designs

Input design

- Objective:
  Find input that minimizes experiment cost
- Constraint:
  Guarantee good control performance

MOOSE example



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

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

```
% Setup system and model
theta0  = [10 -9]';
G = tf([0;theta0],1,1,'variable','z^-1');
H = 1;
Re = 1;

% MOOSE declaration block
beginMoose
  objective minimize(inputPower)
    model G H Re
  identification constraints
    spectrum phiU = FIR(20)
    probability 0.95
    numSamples 100
    application constraints
    ellipsoid(@Vapp,100)
endMoose

optimalFilter = mooseProblem.spectralFactor;
```

CONTACT INFORMATION

Mariette Annergren
PhD Student
mariette.annergren@ee.kth.se

Christian A. Larsson
PhD Student
christian.larsson@ee.kth.se

ACCESS and Automatic Control Lab
KTH Royal Institute of Technology
Stockholm, Sweden

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