emgr

Empirical Gramian Framework

Applications

Model Reduction:	**System Identification:**
State Reduction	Decentralized Control
Parameter Reduction	Sensitivity Analysis
Combined Reduction	Parameter Identification

Systems

Parametrized — First / Second — Order — Linear / Nonlinear — Control Systems

Gramian Types

$\mathbf{W_C}$	Empirical Controllability Gramian
$\mathbf{W_O}$	Empirical Observability Gramian
$\mathbf{W_X}$	Empirical Cross Gramian
$\mathbf{W_Y}$	Empirical Linear Cross Gramian
$\mathbf{W_S}$	Empirical Sensitivity Gramian
$\mathbf{W_I}$	Empirical Identifiability Gramian
$\mathbf{W_J}$	Empirical Joint Gramian

Reduction

State Reduction:	**Parameter Reduction:**	**Combined Reduction:**
$W_C + W_O$	W_S	W_J
W_X , W_Y	W_I	

Identification

Decentralized Control:	**Parameter Identification / Sensitivity Analysis:**
$W_C + W_O$	W_S
W_X , W_Y	W_I
	W_J

Software

Multi-Core: Vectorized + Parallelizable

Compatibility: Octave + Matlab

License: Open Source

Website

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>> http://gramian.de <<