

Integrated Modeling, Simulation and Control of Dynamical Systems

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Automated modeling of dynamical systems has reached a very high level of maturity in recent years. Unfortunately the resulting models are not always well suited for numerical simulation, control or optimization. As a consequence typically a remodeling has to be carried out to use simulation, optimization and control tools in a reliable and satisfactory way. We present a remodeling concept that creates from a given automatically generated model (including over- and under-determined systems) a new system which is well provably well suited for simulation, control and optimization but has the same solution set. In particular all the variables keep their physical meaning. This approach includes a regularization procedure for ill-posed problems as well as a method for the choice of input and output variables in the control setting.