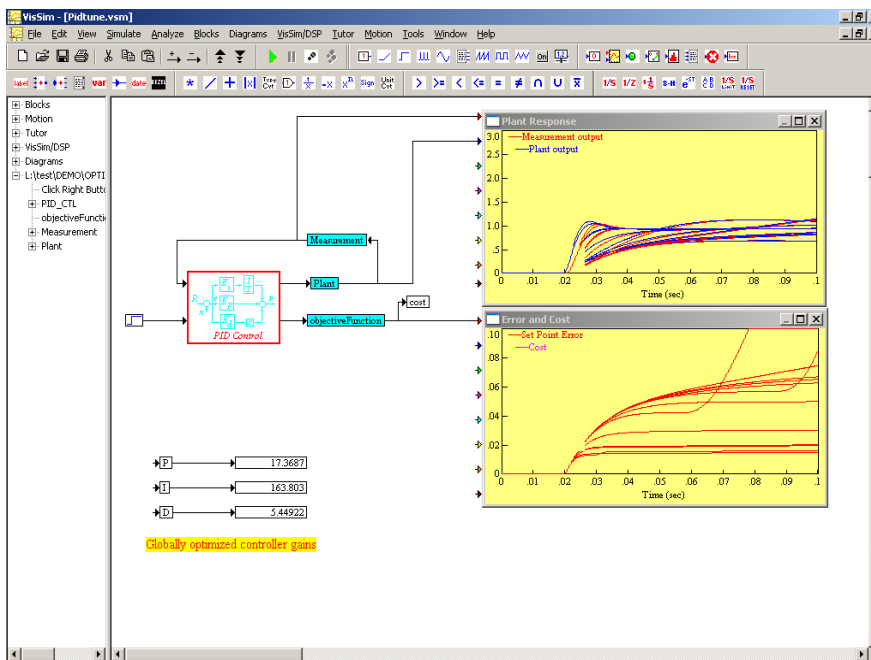


VisSim/OptimizePRO™ 7

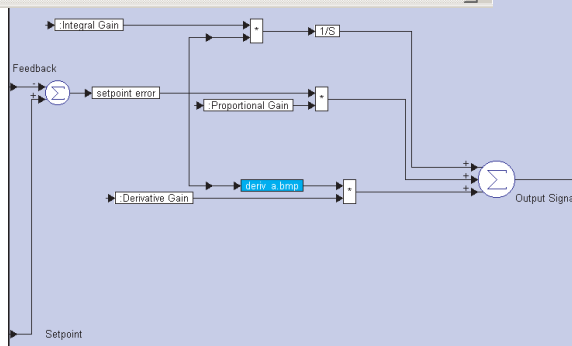
Parameter Optimization Software

VisSim/OptimizePRO calculates optimal values for design variables subject to user-defined constraints starting from initial user guess values. For example, VisSim/OptimizePRO can automatically calculate optimal PID controller gains that give minimal time to setpoint, plus minimal overshoot. VisSim/OptimizePRO allows user-specified cost functions that can consider controller behavior, such as steady-state error, overshoot, and rise and settling times.

VisSim/OptimizePRO also works with a physical system when used with VisSim/Real-TimePRO and VisSim/Embedded Controls Developer.



Constrained optimization of controller gains of a PID controller with VisSim/OptimizePRO. The initial guess values and final optimized values of the PID controller gains are displayed in the bottom left corner of the diagram.



PID control structure, which is accessible by right-clicking on the PID CONTROLLER compound block in the above diagram.

Acknowledgments

VisSim/OptimizePRO is developed by and licensed from WinWard Technologies, Inc. WinWard Technologies provides general linear and nonlinear optimization technology developed by leading experts and scientists.

Highlights

- Constrained optimization
- General linear and nonlinear optimization
- Minimum or maximum of the objective functions
- Multi-nonlinear constraint optimization
- Optimizes systems with no constraints
- Optimizes systems with upper and lower bounds on the design variables
- Problem setup through interactive dialog boxes
- Reporting of optimization progress and diagnostics

Technical Specifications

PROBLEM FORMULATION

Minimize the objective function $g(X)$ subject to the constraints:

$$g_l b_i \leq g_i(X) \leq g_u b_i \quad \text{for } i = 1, \dots, m$$

$$x_l b_j \leq x_j \leq x_u b_j \quad \text{for } j = 1, \dots, n$$

where X is a vector of n variables x_1, \dots, x_n , and the functions g_1, \dots, g_m may all depend on X .

METHOD OF SOLUTION

Use a generalized, reduced gradient algorithm named GRG2 to determine optimal values for the design variables subject to all the constraints.

System Requirements

- Professional VisSim 7
- 4MB RAM
- 1MB disk space

Sample Applications

- Brake and suspension tuning
- Economics
- Gain and parameter optimization
- Least cost shipment packing and scheduling
- Material handling systems
- Missile trajectory optimization
- Multiple control loop optimization
- Optimal HVAC duct placement
- Parametric system identification and modeling
- PID tuning
- Plant and product management

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