



# Optimization of Chilled Water Plant Operation using Modelica Buildings Library

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# Model Predictive Control for Chilled Water Plants

**DoD ESTCP Project:** Optimization operation efficiency: Integrating energy information systems(EIS) and model-based diagnostics

Period: 2012-2015

Funding: \$ 2.3M

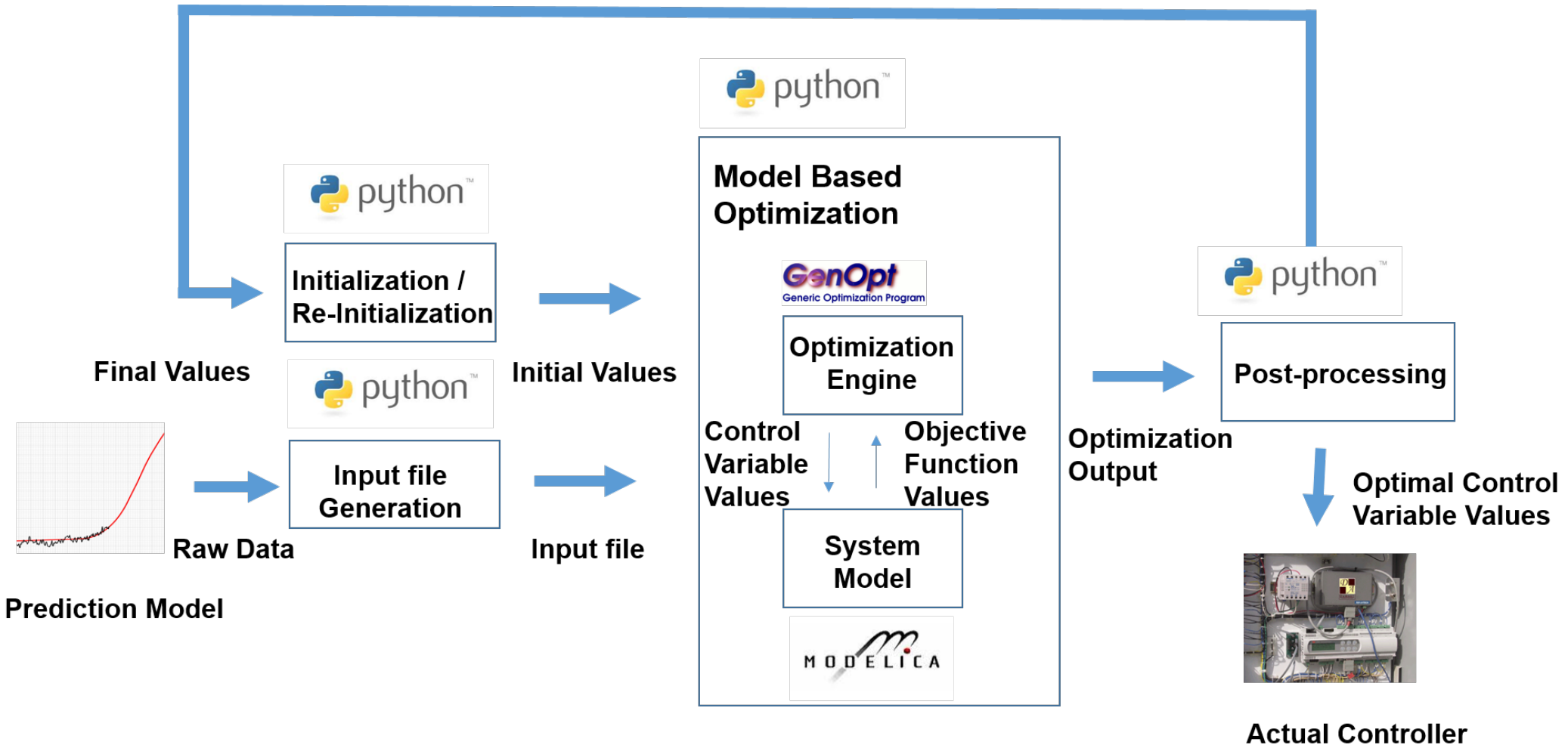
Project Team:

- Lawrence Berkeley National Lab
- University of Miami
- IBM

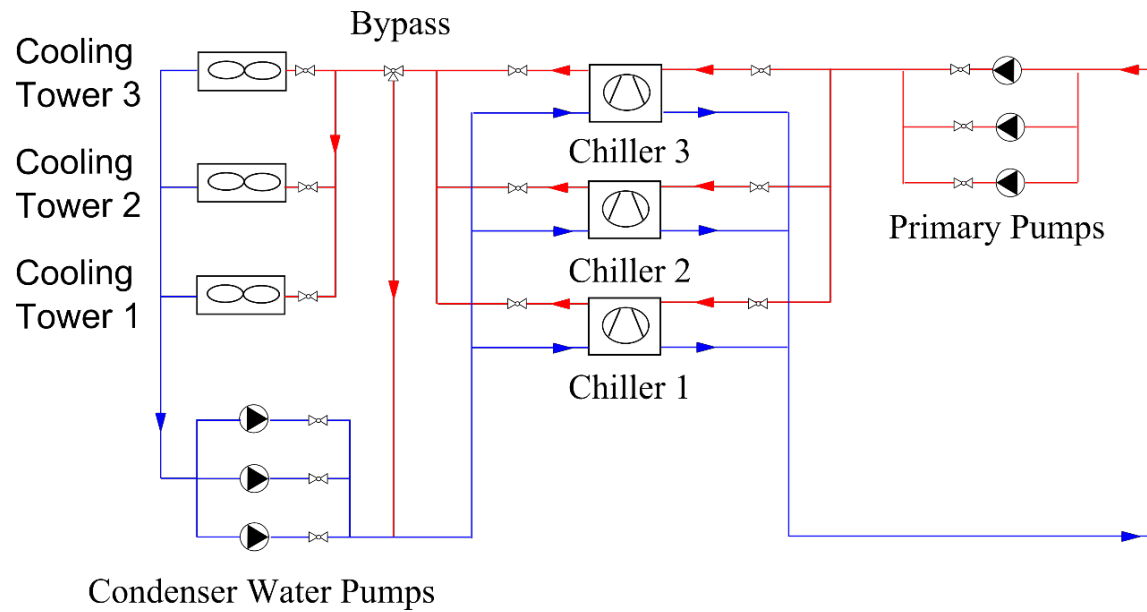
Site: United States Naval Academy



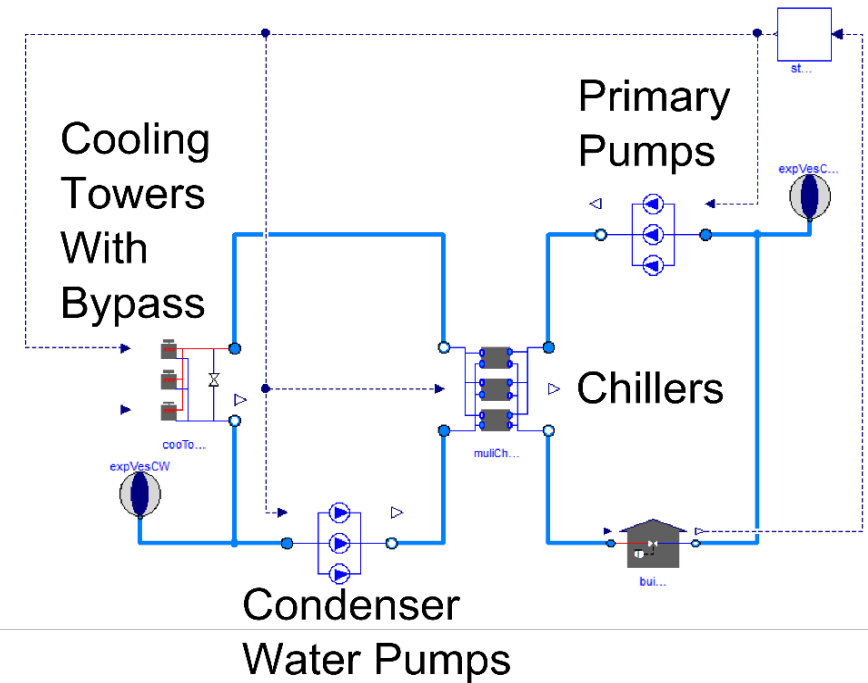
# Framework of Model Predictive Control for Chillers



# System modeling with Modelica *Buildings Library*



Chiller Plant Schematic



Modelica Model

# Annual Energy Saving Potential

Optimization Methods	Energy Saving	Computing Hours
Hourly Exhaustive Search	9.47%	31.4
Hourly GPS	9.46%	10.7
Daily GPS	9.09%	0.9
Energy Saving	490-511 MWh	
Cost Saving	\$63,700-\$66,430	

GPS: Hooke Jeeves Generic Pattern Search