Control Methodologies

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Main Types Of Wave Energy Control

Reactive Force Control
    - Causal
    - Acausal

Model Predictive Control

New Type of Control

Evolved control strategy

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Reactive Force Control

Causal
   - Requres prediction of future waves (difficult)
Acausal
   - No prediction of future waves required (sub-optimal)

Would be optimal power extraction **IF** they can be implemented perfectly

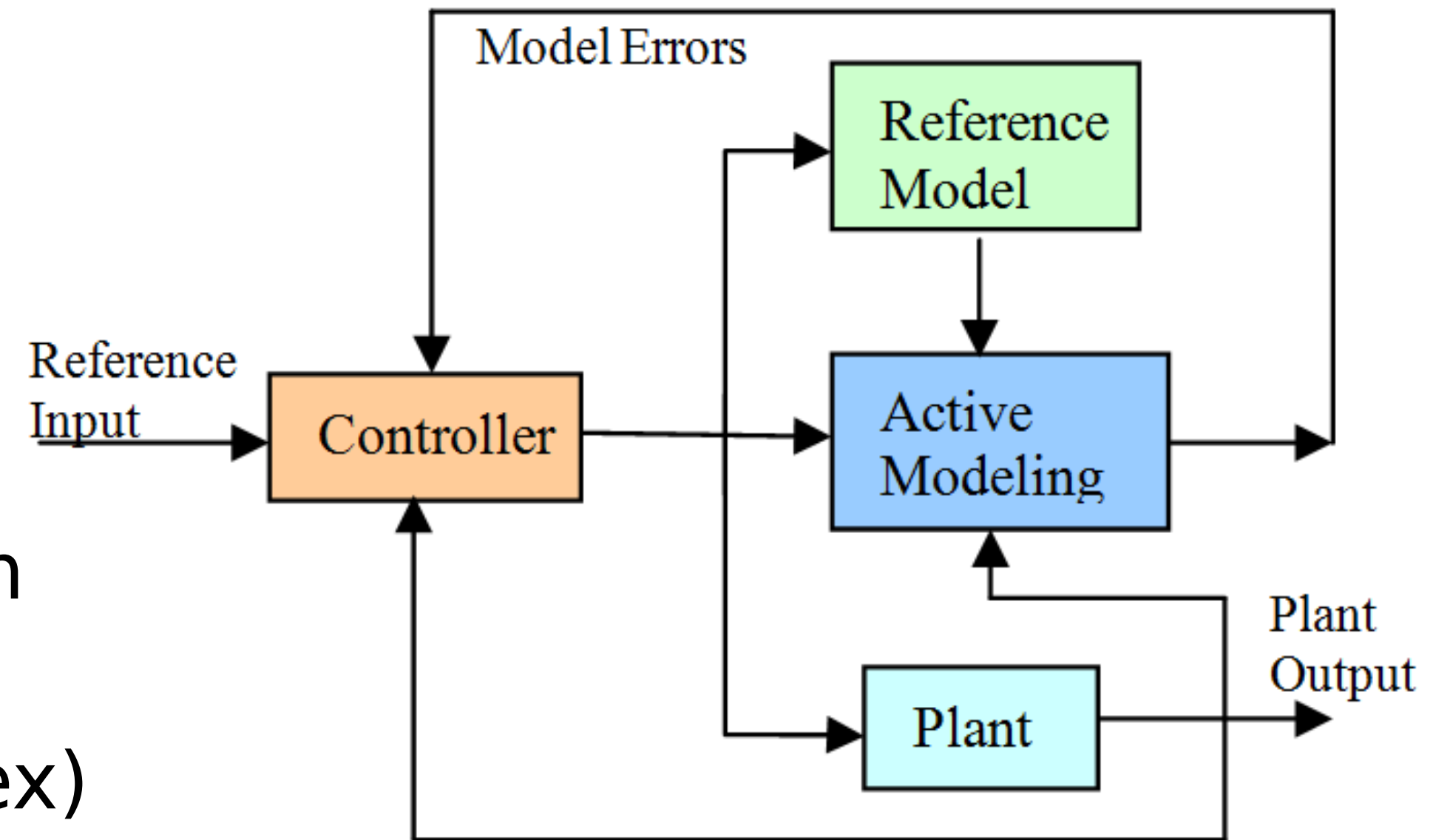Non-linearities make this impossible (end stops, force limits)

Required forces and power ratings can be 10 times rated mean power

Model Predictive Control

Deals well with non-linearities

Published research appling to WECs
(Oregon state university)

Requires prediction model of system
dynamics to compare to reality
(computationally expensive, complex)

Evolved Control Algorithm

Evolutionary computing (genetic algorithms) have been used before to optimise existing control strategies

We propose to design/generate the control strategy itself using a genetic algorithm approach

Take inputs provided by WEC system (position, velocity, force measurements etc.) and evolve a strategy to control the WEC with realistic constraints

QUESTIONS?