

ABSTRACT

SYSTEMS AND METHODS FOR OPTIMIZATION OF DATA CENTER COOLING

Systems and methods for optimizing control parameters of a data center cooling system using reinforcement learning are disclosed. A method for optimizing control parameters for a data center cooling system, comprises: initializing an actor neural network configured to generate an indication of a subsequent control action in response to an actor neural network input vector comprising an indication of a current state of the data center cooling system; initializing a critic neural network configured to generate a cost indication in response to a critic neural network input vector comprising an indication of the current state of the data center cooling system and a subsequent control action; receiving trace data indicating control actions, previous states of the data center cooling system, and corresponding temperature data and energy usage data for the data center cooling system; training the critic neural network by determining a set of parameter weights for the critic neural network which minimizes error between an output of the critic neural network and reward data corresponding to the temperature data and energy usage data for the data center cooling system; training the actor neural network by determining a set of parameter weights for the actor neural network which minimize the cost indication generated by the critic neural network; and using the trained actor neural network to generate a set of control parameters for the data center cooling system.

[Figure 7 to be printed with Abstract]