## ABSTRACT


### METHOD AND SYSTEM FOR OPTIMIZING COOLING RESOURCES IN A DATA CENTER BASED ON WORKLOAD PREDICTION

The present invention provides a method for optimizing cooling resources in a data center based on workload prediction and a system thereof. The method includes the steps of: continuously collecting data in real-time from a plurality of sensors distributed across various sections of the data center; predicting future workload demands and corresponding cooling requirements over time and space in each section of the data center using historical and real-time collected data; determining whether to allocate the predicted workload demand to a section that meets the corresponding cooling requirements or to adjust the cooling resources to achieve the required cooling levels, whichever results in more optimized energy usage; and dynamically adjusting the cooling resources in each section of the data center based on real-time and predicted workload demands over time to minimize energy consumption and operational costs, thereby ensuring optimal cooling without over-provisioning.

(Figure. 2)