Article

**Deploying a deep learning-based application for an efficient Thermal Energy Storage Air-Conditioning (TES-AC) system: Design guidelines**

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**Abstract:** Facility management and maintenance of Thermal-Energy-Storage Air-Conditioning (TES-AC) system is a tedious task at a large scale mainly due to the charging load that can increase energy consumption if needed to be charged at peak hours. Besides, maintenance of TES-AC at a large scale gets complex as it contains many sensor data. By utilizing deep learning techniques on the sensor data, charging load prediction can be made possible, so facility managers can prepare in advance. However, a deep learning-based application will be unusable if it is not deployed in a user-friendly manner where facility managers can benefit from this application. Hence, this research focuses on gathering design guidelines for a deep learning-based application and further validates the design considerations with a developed application for efficient human-computer interaction through qualitative analysis. Furthermore, it evaluates the user satisfaction of the developed advanced application for TES-AC according to the gathered design guidelines.

**Keywords:** Advanced Application; Deep Learning; Thermal-Energy-Storage; Air-Conditioner; Facility Management and Maintenance; Analysis; Design Guidelines