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This paper is organized into six sections including this section. In Section 2, the related work is discussed. In Section 3, the proposed Automated Home Management (AHM) system is introduced. A detailed description of the proposed AHM system is presented in Section 4. In Section 5, the simulation results are illustrated. Finally, Section 6 summarizes the paper.

Demand management of energy for smart home is developed in [16] using fuzzy logic to manage the electric demand and reduce its cost. The inputs of fuzzy controller are electricity price, predicted load demand, battery charge level, and available power. The output of fuzzy controller is the rate of charge, switching to grid decision, and switching to battery source decision. However, the specific loads for smart home are not considered. In addition, the user comfort is not taken into account.

In [17], current sensors are attached for each electric outlet of smart home to monitor and control its electric load. The users can control the energy consumption of the outlets. The user can add financial limit or time limit for the operation of outlet. After exceeding of these limits, the electricity is disconnected from the outlet. However, the proposed technique in [17] considers only the outlet rather than considering the load type. Moreover, user comfort and electricity price are not considered.

An energy management controller (EMC) is proposed in [18] to improve energy consumption, User Comfort (UC), Peak to Average Ratio (PAR), and curtail load demand. Real Time Price (RTP) is considered as tariff for bill generation. However, it does not considered the shortages in the electricity supply.

The problem of electrical task scheduling is introduced in [19]. The objectives are to minimize the daily cost or the consumer dissatisfaction. The results show that a saving on the daily cost is achieved. In [20], demand response model is applied to residential users. Specific loads are considered such as television, air conditioner, and lamps. The load usage is optimized to reduce the daily cost. However, the above approaches consider only specific types of electrical load. In addition, the objectives are considered separately, and optimized using Pareto optimizing.

In [22], Real-Time Electricity Price based Energy Management (RTEPEM) system is introduced for DC microgrid. RTEPEM manages the electrical source selection and load scheduling so that the electricity cost is optimized. The electrical sources used in RTEPEM are PU, PV, and storage devices (BB and Hybrid Car (HC)). RTEPEM selects the source with the cheapest cost to supply the load. RTEPEM shifts the deferrable load to hours with lowest energy cost. However, the objective function in [22] do not consider the user comfort.