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**Title:** A Review on Energy Consumption Optimization Techniques in IoT Based Smart Building Environments
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**Abstract:** In recent years, due to the unnecessary wastage of electrical energy in residential buildings, the requirement of energy optimization and user comfort has gained vital importance. In the literature, various techniques have been proposed addressing the energy optimization problem. The goal of each technique is to maintain a balance between user comfort and energy requirements, such that the user can achieve the desired comfort level with the minimum amount of energy consumption. Researchers have addressed the issue with the help of different optimization algorithms and variations in the parameters to reduce energy consumption. To the best of our knowledge, this problem is not solved yet due to its challenging nature. The gaps in the literature are due to advancements in technology, the drawbacks of optimization algorithms, and the introduction of new optimization algorithms. Further, many newly proposed optimization algorithms have produced better accuracy on the benchmark instances but have not been applied yet for the optimization of energy consumption in smart homes. In this paper, we have carried out a detailed literature review of the techniques used for the optimization of energy consumption and scheduling in smart homes. Detailed discussion has been carried out on different factors contributing towards thermal comfort, visual comfort, and air quality comfort. We have also reviewed the fog and edge computing techniques used in smart homes.

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