عنوان مقاله:

Harvesting Daylight in High-rise Office Buildings Using Phyllotaxis Model

محل انتشار:

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خلاصه مقاله:

Various researches have introduced methods to use daylight in office buildings in the Middle Eas t zone, but none of them have ever considered the use of plant leaf arrangement, called phyllotaxis, as a comprehensive solution for harves ting daylight. The idea of the Phyllotaxis Tower has been raised for several years but the main ques tion of this research is whether using the phyllotaxis model is capable of exploiting daylight in high-rise buildings or not. So, in response to this ques tion, the main aim of the research was set to evaluate daylight efficiency in high-rise office buildings by presenting an exemplary and phyllotaxis-inspired design. The research method is encompassed several s teps including, s tudying the literature on the subject firs tly, then modeling a prototype building based on the Biomimicry Problem-Based approach, and eventually computer simulation to evaluate the performance of the proposed building. The results show that office units can get daylight illuminance of ۵۰۰ lux at ۵۰% of operating time per year in addition to proper performance on four single days of different seasons of the year. Furthermore, the sample building obtained label B of energy consumption from S tandard No. ۱۴۲۵۴ presented by the Ins titute of S tandards and Indus trial Research of Iran, which has been compared with the energy label of ۴۵ office buildings in the same location and same climate conditions, based on the figures are defined on the aforementioned s tandard and .has the bes t performance among them

کلمات کلیدی:

Daylight, Energy efficiency, visual comfort, High-rise building, Phyllotaxis, Biomimicry