Abstract

      Nowadays, computer software for architectural lighting design can not satisfy the demand of designers effectively, because they are complicated and not user-friendly for architects and lighting designers. Moreover, these softwares can not response to the users' commands in real-time. Thus, the poor interaction of current available softwares became the major obstacle in the design process. In other words, designers have to simulate lighting scenarios one at a time separately again and again. With this limitation, the application of the lighting design softwares is not successful enough and becomes unpopular. The objective of this research is to apply the scale model for simulation of dynamic lighting scenarios by microcontroller and combines the software developed by sets of processing scripts to optimize the integration of the lighting design and energy consumption in the building.

      It is found that the use of scale model, hardware, and software can vividly demonstrate changes in actual lighting appearance, energy consumption, optimum level of illumination, automatic adjustment level of the artificial lights with response to daylights, or occasional adjustment according to the users' requirement. Despite the fact that developing the scale model is costly and time-consuming, the scale model is proven to be one of clear communication approaches that can help architects to present their lighting design ideas to both clients and their design teams. In addition, this new lighting design tool can be developed further as a new effective teaching media for architectural lighting study in the future.