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Real-time solar exposure in complex cities

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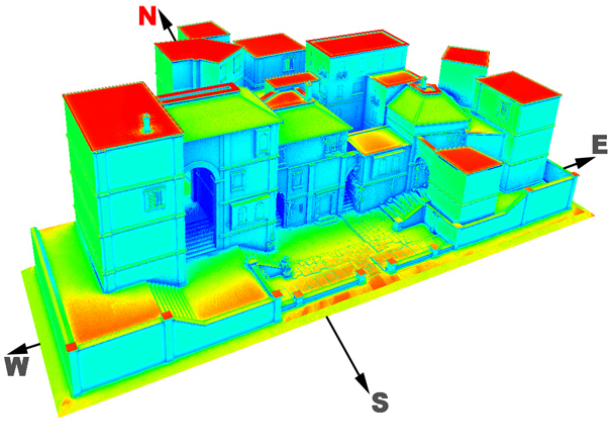

In urban design, estimating solar exposure on complex city models is crucial but existing solutions typically focus on simplified building models and are too demanding in terms of memory and computational time. In this paper, we propose an interactive technique that estimates solar exposure on detailed urban scenes. Given a directional exposure map computed over a given time period, we estimate the sky visibility factor that serves to evaluate the final exposure at each visible point. This is done using a screenï¿½ï¿½space method based on a twoï¿½ï¿½scale approach, which is geometry independent and has low storage costs. Our method performs at interactive rates and is designerï¿½ï¿½oriented. The proposed technique is relevant in architecture and sustainable building design as it provides tools to estimate the energy performance of buildings as well as weathering effects in urban environments.In urban design, estimating solar exposure on complex city models is crucial but existing solutions typically focus on simplified building models and are too demanding in terms of memory and computational time. In this paper, we propose an interactive technique that estimates solar exposure on detailed urban scenes. Given a directional exposure map computed over a given time period, we estimate the sky visibility factor that serves to evaluate the final exposure at each visible point. This is done using a screenï¿½ï¿½space method based on a twoï¿½ï¿½scale approach, which is geometry independent and has low storage costs.

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