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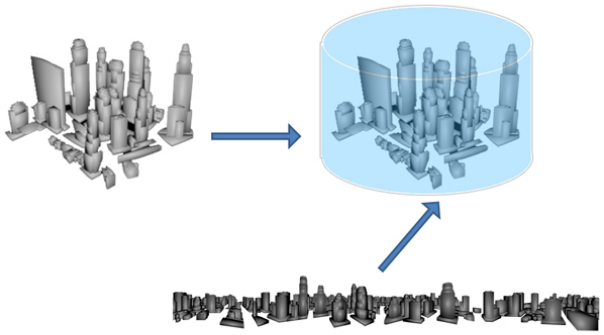
www.virvig.eu
C. Llorens i Artigas 4-6
Edifici U, 1er pis
E- 08028- Barcelona

Far-LoD: Level of Detail for Massive Sky View Factor Calculations in Large Cities

Munoz, David; Beckers, Benoit; Besuievsky, Gonzalo; Patow, Gustavo A.



In many applications, such as in urban physical simulations or in the study of the effect of the solar impact at different scales, models with different levels of detail are required. In this paper we propose an efficient system for quickly computing the Sky View Factor (SVF) for any point inside a large city. To do that, we embed the city into a regular grid, and for each cell we select a subset of the geometry consisting of a square area centered on the cell and including it. Then, we remove the selected geometry from the city model and we project the rest onto a panoramic image (in our case, the sides of a box). Later, when several SVF evaluations are required, we only need to determine the cell that the evaluation point belongs to, and compute the SVF with the cells geometry plus the environment map. To test our system, we perform several evaluations inside a cells area, and compare the results with the ground truth SVF evaluation. Our results show the feasibility of the method and its advantages when used for a large set of computations. We show that our tool provides a way to handle the complexity of urban scale models, and specifically to study the sensitivity of the geometry.

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