Assessment of residential visual privacy in urban environments

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Abstract: Visual privacy is an important issue in modern society. This paper proposes an improved Potential Visual Exposure Index (I-PVEI) to evaluate the privacy risks along building facades in a dense residential environment. This method was constructed by weighting the differential visual capability inside the human field of view for the measurement of visual privacy, which allows for better representation of visual conflict in residential environments. A case study at Kowloon, Hong Kong was validated, and the results demonstrate: (1) Potential observers from building and pedestrian levels had different impacts on the neighborhood, resulting in different distribution patterns on the building facades; The higher the floor, the better the visual privacy for the pedestrian; While the privacy can be well-preserved on a lower or upper floor for the observers from buildings; (2) Although significant changes in I-PVEI values could be found across building facades, they almost presented a uniform change trend on the same facade, where the occupants on the middle floor suffer severely harm; (3) The proposed indicator can perceive subtle privacy risks of openings located at the corner of buildings, indicating that the I-PVEI is an optional indicator for assessing visual privacy in building design.

Keywords: Visual privacy; Improved Potential Visual Exposure Index (I-PVEI); visual perception; distribution patterns; quantitative model

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