

Introducing a quantitative method for visual analysis of urban coastal environments with feedback based on the Space Syntax method

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Abstract:

This paper reports on a quantitative method for visual analysis of urban coastal environments. This method is based on visual permeability to the coastline and the water expanse beyond it. It also reports on positive feedback acquired by evaluating accessibility to the coastline by a method inspired by the Space Syntax method. The visual permeability to the coastline is measured in geometrical terms, similar to Isovist measurements, but at different levels of height of the built volumes (a multi level Isovist). The measurements are carried out mostly from the built stories looking towards the water front. In addition, the visibility to the water is measured from the public open spaces at street level.

Currently there are several methods to evaluate urban environmental quality: qualitative and quantitative. This method belongs to quantitative methods of spatial analysis that refer to visibility and accessibility in space (Hilier and Hansen, 1997; Hillier, 1986; Peponis et al., 1997; Turner et al., 2001; Batty, 2001; Fisher Gewirtzman et al., 2002).

The visual analysis and evaluation is applied to selected case studies from around the world, and enables comparative evaluation and ranking. The objective of such evaluation is to examine and characterize morphological principals of urban morphologies that are more permeable to the coastline view and are considered to appear more qualitative. Some of the preliminary findings concerning the morphological characteristics that enable better visual permeability to the water were:

- Urban developments with facades perpendicular and diverse to the water
- Wide open squares facing the water
- A wall of buildings fronting the water sliced by streets directed to the water.

The findings at street level were compared to the accessibility to the water based on the Space Syntax method. The comparison gave positive feedback to this introduced method and highlighted a connection between the accessibility and openness to the view. Dissimilar to the traditional Space Syntax method, the calculations for evaluating the accessibility to the water were based on measurements in one

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direction only: accessibility towards the water. The evaluation results were compared with the findings of the quantitative method for visual analysis. The comparison showed similar ranking between the highest and the lowest results. The comparison between the two methods gave positive feedback that established the findings of the visual analysis. Similar characterization could contribute to future design of coastal developments.

A clear affinity exists between urban morphologies and urban environmental quality with different density levels. Waterfronts are one of the most attractive resources. Many people and financial forces are interested in such attractive locations, which suit a variety of uses. Financially, the pressure is to intensify the first front strip of built-up areas, which could lead to a visual barrier for the interior urban fabric. This influences the immediate rear urban fabric resulting in deterioration of its environmental quality and reduces its real estate value. It is an important goal to analyze and evaluate the relation between visual openness to a preferable view, in this case the coastal view, and building typologies in order to realize the urban morphologies that enable better visibility to the view.

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