

# A proposed methodology to normalise total depth values when applying the visibility graph analysis

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## Abstract

The aim of this paper is fourfold:

To outline the problem of comparing graphs of different sizes in current techniques of isovist-based Visibility Graph Analysis (VGA) using the Depthmap software,

To establish the two considerations of “size” in VGA; the total number of nodes in the graph (which is dependent on the spacing set between grid tiles for analysis) and the actual scale of the spatial layout,

To demonstrate the variation between output results arising from using different grid sizes on the same spatial system and the incomparability of “Total Depth” and “Mean Depth” measures in spatial systems of significantly different scales, and

To experiment with transforming the output Total Depth measures, from Depthmap to RRA measures using “D-value” and “P-value” adjustments to normalise the effects of size.

This paper focuses on the use of VGA for building interiors. The results show that Total Depth measures, as the output values of Depthmap, are limited for syntactical comparative analysis of building layouts across a sample of varying sizes. It identifies the methodology, first described by Hillier and Hanson (1984) in the Social Logic of Space, for transforming (axial and convex based) Total Depth measures into Real Relativised Asymmetry measures (RRA or spatial integration), as applicable for VGA. Not only does RRA measures eliminate the effect of size but also it does not effect the distribution of output VGA Total Depth values, making it a suitable methodology for researchers undertaking comparative studies of building types using VGA.

## Keywords

Visibility graph analysis,  
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