Visual structure in Japanese gardens

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*Near no.**23** on* http://www.goldsmiths.ac.uk/find-us/campus-map.php

Abstract

Japanese dry landscape gardens show interesting visual effects, especially where rich visual designs are presented as perceptually calming environments. Drawing on *visual psychology* we use the concept of "figure-ground" relationships to investigate the appeal of some gardens. A "figure" of rocks and bushes is typically placed on an empty "ground" of gravel. We show that texture patterns and grouping arrangements between visual cues are repeated and balanced at multiple spatial scales, qualifying as a naturalistic design. The structure of visual "ground" is not so readily apparent and the analysis benefits from a quantitative approach. Computed *perceptual sensitivity maps* (Kovacs *et al.*, 1998), equivalent to *medial axes*, reveal the structure of empty expanses between rocks in the famous Ryoanji garden. Medial axis loci have numerous unexpected non-accidental properties that are destroyed with random perturbation of the original design. The analysis leads to a novel interpretation of structure in the "ground" of this garden design. The structure of the "empty space" in some other famous dry landscape gardens is found to be similar to that at Ryoanji, with some interesting variations on a common theme. This suggests that designers of traditional Japanese gardens possessed sophisticated intuitive understanding of and control over subtle visual effects. Our findings provide directions toward the design of more naturalistic, calming visual environments.

References:

1. *Visual structure in Japanese gardens*, Gert J. van Tonder, Michael J. Lyons, and Yoshimichi Ejima Journal of the IEICE, 86(10):742-746, 2003.

2. *Visual Structure of a Japanese Zen Garden*, Gert J. van Tonder, Michael J. Lyons, Yoshimichi Ejima, Nature 419, pp. 359-360, 2002.