

Calming Visual Spaces: Learning from Kyoto Zen Gardens

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1 Introduction

Zen gardens exhibit sophisticated visual designs achieved with minimal compositions and engender a calm, contemplative atmosphere. Here we use perceptual models to study Zen garden design with the aim of discovering guidelines for the creation of calm visual spaces.

2 Visual Grouping

Models of scene understanding reveal how boundary contour, junction, and surface texture elements are combined by the visual system into the patterns which we perceive when looking at a scene. Gestalt laws of proximity, similarity, smoothness, and enclosedness provide an intuitive set of cues to understand this process. Analogously, in Zen gardens, visual heuristics are used to guide selection and control of visual pattern elements to express calmness and avoid conflicting, confusing scenes. Several design heuristics are at work in figure 1, e.g. the fractal-like repetition of a triangular pattern, giving this garden a harmonious, natural appearance. Further examples will be discussed in the presentation.

3 Medial Axis Transform

In Zen gardens considerable emphasis is placed on the beauty of “empty” space. A famous example is the dry landscape garden at Ryoanji temple (figure 2), which consists of a sparse arrangement of five clusters of 15 rocks and some moss surrounded by an expanse of raked gravel. Medial axis transform analysis, studied in models of perception and in computer vision, is useful for visualizing the structure of these empty spaces. The medial axis transform of the empty space in the Ryoanji garden reveals a non-accidental, simple, self-similar structure, which may explain the strong visual appeal of this garden.

4 Conclusion

Consideration of visual Gestalt cues, multi-scale patterns, and the structure of empty space deepens insight into the perceptual basis of traditional garden aesthetic qualities of asymmetry, simplicity, naturalness, and tranquility. We will describe guidelines for calming visual environments, illustrating these with photographic images and Quicktime VR [Shortreed 2001] of Kyoto’s most famous Zen gardens. These and the medial axis transform visualization technique should interest those who wish to create calm visual spaces, virtual or real.

References

SHORTREED, I. 2001. *Kyoto Gardens: A virtual stroll through Zen landscapes*. Mercury Software CD-ROM.

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Figure 1: Similar patterns are repeated at multiple scales in Dokuzai-tei garden, Daitokuji temple.



Figure 2: **Upper:** composite picture of Ryoanji garden. **Lower:** medial axis transform of Ryoanji garden with the (Edo period) temple building plan superimposed. Dark lines indicate loci of maximal local symmetry. The trunk of the medial axis, along which the view of the garden is optimal, passes close to center of the abbot’s room.