



Quantifying Texture Discrimination via Additive Functionals

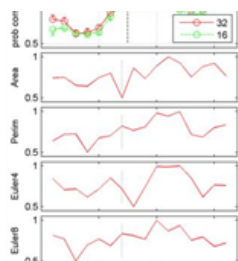
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It is well known that higher order correlations between pixels in a grey level image are significant when attempting to discriminate structured textures from a uniformly random ones. It has been established that the visual cortex utilises higher order spatial correlations in order to discriminate and identify textures. For edge and corner relations to be described, systems designed to encode correlations between three or more points are needed. These higher order correlations define structure in textures and so, in understanding how visual systems work, we must understand which correlations are utilised. We evaluate human discrimination performance for 16 binary textures for about 20 individuals and compared it with statistics generated from 2D, binary Minkowski functionals. Relationships between the psychometric results and a mixed fourth order correlations such as the Euler number were discovered. This result sheds light into a possible mechanism for perception of visual clues that mimics the calculation of the difference between the number of holes and contiguous regions in an image belonging to a particular texture family.

Figure 1



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