

Approximately uniform isodiscrimination contours within a perceptual space of local image statistics

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## Motivation

- Four-point correlations within $2 \times 2$ regions capture the informative local statistics in binarized natural mages. The corresponding set of image statistics has ten parameters that range in order from 1 to 4 .
- Previously (Victor et al., VSS 2013) we showed that at the origin of the space (i.e., for discrimination from randomness), threshold judgments implied a simple combination rule for image statistics: they combined in a quadratic fashion, generating ellipsoidal isodiscrimination contours. Here, we extend We used a texture ese image statistics.
Threshold Segmentation Task


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## Conclusions

> The sizes of isodiscrimination contours around peripheral reference points in the space were similar to their sizes at the origin.

- Around peripheral reference points, isodiscrimination contours did not have exactly the same shape as they did at the origin, and these deviations were consistent across subjects. However, the change in shape was much less than the expansion or contraction that would match the limits of the stimulus domain
> Perceptual thresholds are determined primarily by the vector difference between image statistics. That is, the local perceptual metric is approximately Euclidean, throughout the measured space.


## Analysis

 to achieve a fraction correct of 0.62 planes, along with $95 \%$ confidencelimits via bootstrap. limits via bootstrap.

Results - Isodiscrimination contours throughout the space


Sample Weibull functions show the fraction correct for stimulit that vary in
several l irections from a reference several directions from a reference
point $(S: M C$ shown). Threshold was
taken to be the taken to be the image statistic value
to achieve a fraction correct of 0.625


The planar plots show the perceptual The planar plots show the perceptual
thresholds in each of the coordinate


MC


SR


KP


RS


Thresholds in the periphery of the space are only slightly higher than thresholds at the origin. This is demonstrated by the isodiscrimination contours (left) and their characteristic sizes (right)



## References

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