



# Local-feature-based similarity measure for stochastic resonance in visual perception of spatially structured images

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Résumé en anglais For images, stochastic resonance or useful-noise effects have previously been assessed with low-level pixel-based information measures. Such measures are not sensitive to coherent spatial structures usually existing in images. As a result, we show that such measures are not sufficient to properly account for stochastic resonance occurring in visual perception. We introduce higher-level similarity measures, inspired from visual perception, and based on local feature descriptors of scale invariant feature transform (SIFT) type. We demonstrate that such SIFT-based measures allow for an assessment of stochastic resonance that matches the visual perception of images with spatial structures. Constructive action of noise is registered in this way with both additive noise and multiplicative speckle noise. Speckle noise, with its grainy appearance, is particularly prone to introducing spurious spatial structures in images, and the stochastic resonance visually perceived and quantitatively assessed with SIFT-based measures is specially examined in this context.

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