Psychophysical discrimination of natural scenes: Thresholds and subjective ratings

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We have studied how observers detect small differences in digitised monochrome photographs of natural scenes (Párraga et al, 2000 *Current Biology* **10** 35 - 38). Using morphing or other processing techniques, we have made sequences of images where a photograph of one scene changes in 40 or more steps into a photograph of a related scene; eg sequences where a smiling face transforms into a frowning one, one fruit transforms into another, or a landscape with shadows transforms into one without. By measuring discrimination thresholds in 2AFC experiments with reference images taken regularly through an image set, we determined the distance between any pair of images within each set in a threshold-discrimination space. Then, observers gave subjective ratings to the difference in appearance of pairs of images taken from within the sets. Pairs from each image set were randomly interleaved with pairs from the other sets, and the pairs differed by up to 16 discrimination threshold steps. Subjective ratings were linearly related to the number of threshold steps by which the images differed. However, the constant of proportionality differed between image sets -- some image changes were more subjectively salient than others.[Supported by Dstl/EPSRC and BBSRC.]