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Predicting webpage aesthetics with heatmap entropy

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ABSTRACT

This paper introduces a descriptive global index for eye-tracking data called heatmap entropy, or visual attention entropy (VAE), and discerns its predictive value for webpage aesthetics. VAE represents the chaos, or uncertainty, in the allocation of visual attention. In the experiment, we tracked and recorded 30 observers' initial landings on 40 web pages displayed for 3 seconds each. The results show that the VAE and aesthetic ratings of the web pages are negatively correlated ($r=-0.54$, $P<0.001$). A calibrated form of VAE, known as relative VAE (rVAE), has a more significant correlation with the aesthetic ratings ($r=-0.65$, $P<0.00001$). On its own, the rVAE can differentiate between good- and bad-looking pages to a certain degree of accuracy (two-class ANOVA with $F=26.84$, $P<0.00001$). Further investigation reveals that the performances of both VAE and rVAE improve steadily after the first second, and could be better, if the tracking duration was longer than 3 seconds or if more observers were recruited.

KEYWORDS:

Entropy | visual attention | eye tracking | aesthetics | web page

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