Taylor & Francis
Online

Behaviour & Information Technology ›
Volume 40, 2021 - Issue 7

1,081 Views | 22 CrossRef citations to date | 0 Altmetric

Original Articles

Predicting webpage aesthetics with heatmap entropy

Zhenyu Gu, Chenhao Jin, Danny Chang & Liqun Zhang

Pages 676-690 | Received 14 Nov 2017, Accepted 05 Jan 2020, Published online: 24 Jan 2020

Cite this article https://doi.org/10.1080/0144929X.2020.1717626

Check for updates

Sample our Behavioral Sciences Journals
>> Sign in here to start your access to the latest two volumes for 14 days

Full Article Figures & data References Citations Metrics
Reprints & Permissions Read this article Share

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

Acknowledgments

We thank anonymous referees for their useful suggestions.

Disclosure statement

No potential conflict of interest was reported by the authors.

Additional information

Funding

This study was supported by the National Natural Science Foundation of China (Grant No. 71802132).

Related research

People also read | Recommended articles | Cited by 22

Exploring an adverse impact of smartphone overuse on academic performance via health issues: a stimulus-organism-response perspective >

Shaoxiong Fu et al.
Behaviour & Information Technology
Published online: 21 Jan 2020

Information for

- Authors
- R&D professionals
- Editors
- Librarians
- Societies

Open access

- Overview
- Open journals
- Open Select
- Dove Medical Press
- F1000Research

Opportunities

- Reprints and e-prints
- Advertising solutions
- Accelerated publication
- Corporate access solutions

Help and information

- Help and contact
- Newsroom
- All journals
- Books

Keep up to date

Register to receive personalised research and resources by email

Sign me up

Copyright © 2026 Informa UK Limited Privacy policy

Cookies Terms & conditions Accessibility

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG