VISUAL COMPLEXITY RANKINGS
AND ACCESSIBILITY METRICS

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Abstract

The World Wide Web (Web) has become the major means of distribution and use of information by individuals around the world. Web page designers focus on good visual presentation to implicitly help users navigate, understand, and interact with the content. The rapid and constant advancement of technology introduced new ways to present information that leads to visually complex Web pages. Problems arise, though, for people with disabilities, especially those who are visually impaired, because implicit visual cues presented on a Web page cannot be accessed and used.

We assert that, identifying the areas that are complex for sighted users will have direct benefits for blind and visually impaired users. We theorise that by understanding sighted users' visual perception of Web page complexity we can understand the cognitive effort required for interaction with that page. This is an important contribution to the Web accessibility area because by using visual complexity, an identifiable measure, as an implicit marker of cognitive load, Web pages can be designed that are easier to interact with.

Results from user evaluations provided statistical models that, based on the density and diversity of Web page structural elements (such as text, tables, and images), can significantly predict sighted users' perception of Web page visual complexity. The framework is then implemented into the ACTF Eclipse framework by extending the aDesigner accessibility tool to the ViCRAM tool. The tool automatically analyses a Web page with respect to its visual complexity. For each Web page a complexity score, that determines the page's level of visual complexity, and an overlay heatmap, that mimics a user's visual complexity perception by noting the areas that are most visually complex, are generated.

A user and technical evaluation support our assertions and show that the tool can significantly predict the level of visual complexity of a Web page. Therefore, users can have an initial perception of the visual layout of the page and designers
can use this framework to balance Web page visual complexity with usability and accessibility.