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Evaluating Aesthetics for User-Sketched Layouts of Clustered Graphs with Known Clustering Information

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Abstract

This paper aims to empirically analyze the aesthetics for user-sketched layouts of clustered graphs with known clustering information. In our experiments, given not only the adjacency list of a clustered graph but also its predefined clustering information, each participant was asked to manually sketch clustered graphs “nicely” from scratch on a tablet system using a stylus. Different from previous works, the main concern in this paper is on which graph drawing aesthetics people favor when sketching their own drawings of clustered graphs with known clustering information. Another concern of this paper is on the aesthetics of clustered graph layouts employed by participants which include not only characteristics and structures of the final graph layouts but also the behavior of user’s sketching process (including layout creation and adjustment). By observing all layouts and drawing processes, the drawing strategies which participants applied and the drawing aesthetics are analyzed. Results show that most participants were unsurprisingly able to draw graphs with clear presence of bridge edges and clustering cohesiveness; more importantly, to distinguish clusters within the restricted-size tablet screen during the drawing process, some of the participants were still able to make each cluster with fewer edge crossings, more symmetries, and

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