

Visual Utility Evaluation of Differentially Private Scatterplots

Authors: Liudas Panavas, Tarik Crnovrsanin, Jane Adams, Ali Sarvghad, Melanie Tory, Cody Dunne

Summary:

Differentially private scatterplots enable the plotting of two attributes while guaranteeing a specified level of privacy. What a user sees from the scatterplot can be affected by which privacy algorithm is used and how it adds noise to the data. However, there is no existing work that quantifies this effect. We present the results of a pilot data study that compares algorithms for creating differentially private scatterplots based on the visual utility of their results. We compare five popular algorithms across a range of parameters. The results indicate that DAWA and Geometric Truncated are the best algorithms for visual utility. Future research could focus on optimizing the different parameters to maximize utility of the visual representations. A free copy of this paper along with all supplemental materials is available at osf.io (anonymous link).

ACM Author Affiliations: Liudas Panavas: Northeastern University; Tarik Crnovrsanin: Northeastern University; Jane L. Adams: Northeastern University; Ali Sarvghad: University of Massachusetts Amherst; Melanie Tory: Northeastern University; Cody Dunne: Northeastern University