The Role of Trust in Visual Analytic Provenance

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Abstract. Trust is a complex and multidimensional construct, but it is crucial to understanding human behavior and analytic provenance. In the context of visual analytics, trust can be defined as "the truster (user)'s belief that the trustee (VA system) will help them correctly identify and visually distill the most valuable and relevant information content".[1] From prior work, we see that distrust or a lack of trust can lead to differences in analytic workflows and interaction behavior.[2] This phenomenon has important implications not just for analyzing provenance data but also for the adoption and performance of real-time algorithms that learn from behavioral patterns. Still, the role of trust is underexplored in visual analytics and provenance, and there are numerous open questions. For instance, *how do we design to build trust?* Previous work has shown that being transparent about the algorithms used increased user trust,[3] but design guidelines are obscure. Another essential question that needs to be addressed is *how do we measure or evaluate trust?* Existing work in the realm of trust and visual analytics measures trust in a VA system after the user has completed their exploration,[2,3] but trust is volatile and might change through an analytic session. This leads to the final two questions, *how does the system detect and respond to distrust?* Based on the user's level of trust, *can we cater to the user to calibrate their trust in the system?* We believe that these questions will provide a starting point to gather ideas about how we can define the role of trust in visual analytic provenance.

Keywords: Trust · Provenance · Visual Analytics.

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[1] Wenkai Han and Hans-Jorg Schulz. "Beyond Trust Building — Calibrating Trust in Visual Analytics". In: *2020 IEEE Workshop on TRust and EXpertise in Visual Analytics (TREX)*. 2020 IEEE Workshop on TRust and EXpertise in Visual Analytics (TREX). Salt Lake City, UT, USA: IEEE, Oct. 2020, pp. 9–15.

[2] Shayan Monadjemi et al. "Active Visual Analytics: Assisted Data Discovery in Interactive Visualizations via Active Search". In: *arXiv preprint arXiv:2010.08155* (2020).

[3] Aritra Dasgupta et al. "Familiarity Vs Trust: A Comparative Study of Domain Scientists' Trust in Visual Analytics and Conventional Analysis Methods". In: *IEEE Transactions on Visualization and Computer Graphics* 23.1 (2017), pp. 271–280.