**The use of radial tour to understand variable importance, with application to interpreting black-box machine learning models**

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Abstract:

We conducted a crowdsourced n = 108 within-participant user study. Participants were tasked with identifying which variables are attributing to the separation of clusters in multivariate simulated data. A mixed regression model shows strong evidence for a large increase in accuracy for radial tours over the alternatives of discrete principal component analysis and continuous grand tours without interaction.

We demonstrate an interactive application showing radial tours used to explore the variable-level sensitivity of the structure identified from local explanations to further extend the interpretability of a black-box model. This observation-level visual is also paired with global approximations of the data- and explanation-spaces. Tooltips, linked brushing with tabular display, and interactive slider allows the analyst to rapidly explore these spaces, keep local explanations in a broader context, and explore the variable sensitivity of the structure identified by a local explanation.