

A Study on the Benefit of a User-Controlled Radial Tour for Variable Importance for Structure in High-Dimensional Data

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Abstract—Principal component analysis is a long-standing go-to method for exploring multivariate data. Data visualization *tours* are a class of linear projections animated over small changes in the projection basis. The grand tour selects target bases at random to animate between. Alternatively, the manual tour rotates the contribution of a selected variable, offering analysts a unique means to control the basis. This work describes a within-participants user study evaluating the radial tour’s efficacy compared with principal component analysis and the grand tour. A supervised classification task is designed where participants evaluate variable attribution of the separation between two classes. An accuracy measure is defined as a response variable. Data were collected from 108 crowdsourced participants, who performed two trials with each visual for 648 trials in total. Mixed model regression provides strong evidence that the radial tour increases accuracy over the alternatives. Participants subjectively prefer the use of the radial tour.

Index Terms—multivariate data visualization; grand tour; radial tour; dimension reduction; linear projections; user study

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INTRODUCTION

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CONCLUSION

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BIBLIOGRAPHY STYLES

Here are two sample references: Feynman and Vernon Jr. (1963; Dirac 1953).