**New Tools to Interactively Explore the Sensitivity of Structure in Low-dimensional Projections of Data**

Nicholas Spyrison

Monash University,

Faculty of Information and Technology

Abstract:

Exploratory data analysis is the first step to exploring data and validating model assumptions. Visualizations of data-spaces convey a better representation than parameter summarizations alone. Yet, the display of more than 3 attribute dimensions (p > 3) is non-trivial and cannot convey all the information of the data. The analysts' toolbelt to explore such spaces should be extended.

Traditionally, linear projections identify a 2D projection highlighting a feature. This suggests a **location** to look, but leave the local **structure** unexplored. This research develops a **geodesic interpolator**, that allows users to interactively steer a projection. This uniquely allows control of a projection rather that can be used to better discern variable sensitivity to the local structure shown in a projection.

We are currently piloting with-in participant experimental study. That measures the efficacy of geodesic interpolation versus principal component biplots and a grand tour as benchmarks. After this, we plan to plan to extend the interpolator to 3D virtual spaces and perform another experimental study comparing with its counterparts