Projection pursuit: theory, applications and challenges

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Abstract

Projection pursuit is a multivariate statistical technique aimed at finding interesting low-dimensional data projections. It looks for the data projection which maximizes the projection pursuit index, that is a measure of its interestingness. After an interesting projection is found, it is removed to facilitate the search for other interesting features. Projection pursuit addresses three major challenges of multivariate analysis: the curse of dimensionality, the presence of irrelevant features and the limitations of visual perception. Its applications have been hampered by several difficulties of computational, interpretative and inferential nature. Additional problems arise when data are high-dimensional, that is when there are more variables than units. This talk outlines the main features of projection pursuit and its connections with other multivariate techniques. The theory is illustrated with both real and simulated datasets.