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Title: New tools for visualising and explaining multivariate spatio-temporal data

Abstract:

The talk will present two pieces of work on developing new tools to analyze multivariate spatio-temporal data. I will first discuss a multivariate method called projection pursuit. Projection pursuit is a dimension reduction method that finds interesting low dimension projections of the high dimensional data. The algorithm involves an optimization routine that maximizes a “score” given to each projection over projection directions. Usually, projection directions are characterized by matrices and visualizing where the optimizers have searched provides valuable information to understand and diagnose the optimizers when the optimization fails. In this talk, I will showcase some diagnostic plots that help to visualise how and where the optimizers have searched in the parameter space.

The second part of the talk will introduce a new data structure, `cubble`, designed to work with spatio-temporal data for exploratory data analysis. Currently, spatial and temporal software have been separately developed in R using different data formats. This causes frictions when attempting to analyze spatio-temporal data as a whole. Cubble is designed to make spatial and temporal information easily accessible for analysts without the need to constantly rearrange the data format required by spatial and temporal software. I will provide an example on how to create a glyph map to explore the spatio-temporal pattern of weather station data with `cubble`.