

Visualization of multivariate functions, sets, and data

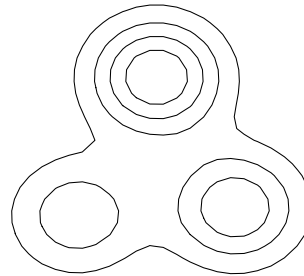
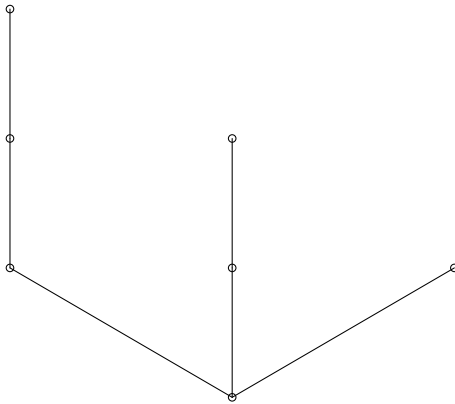
Jussi Klemelä
University of Mannheim

June 7, 2006

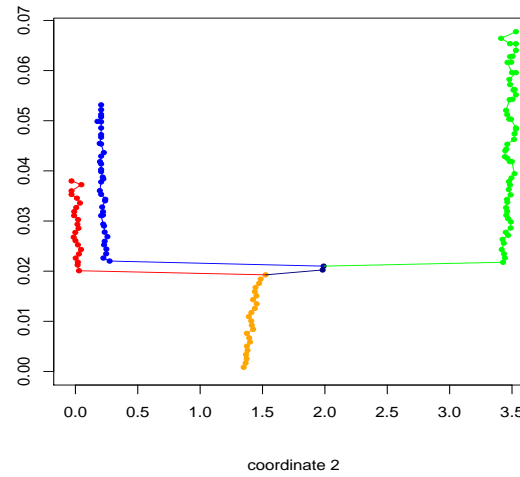
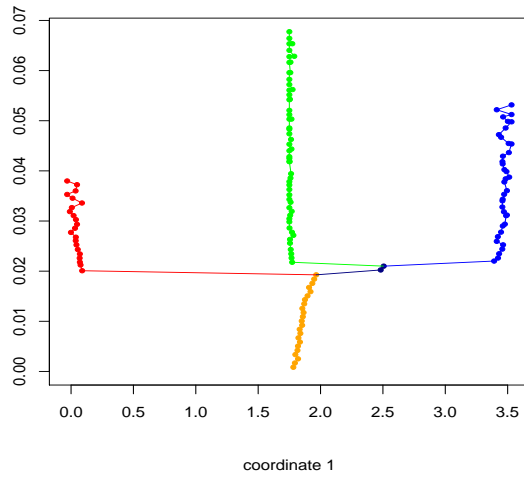
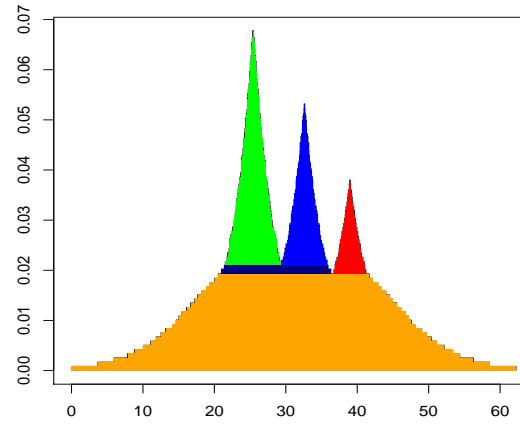
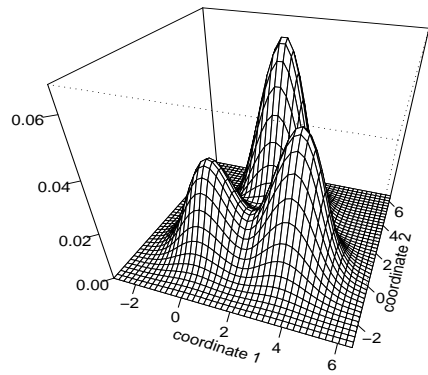
Level set trees (contour trees)

A level set tree is a basic concept underlying many visualization tools.

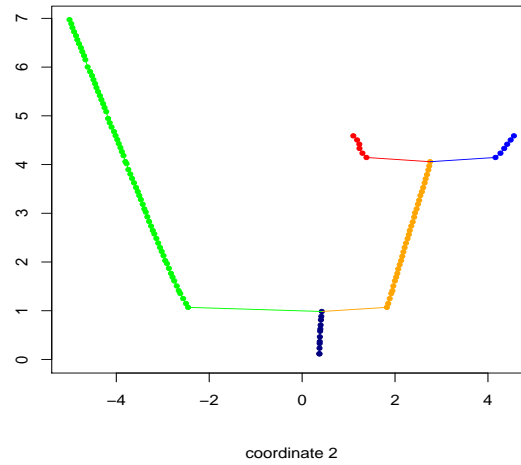
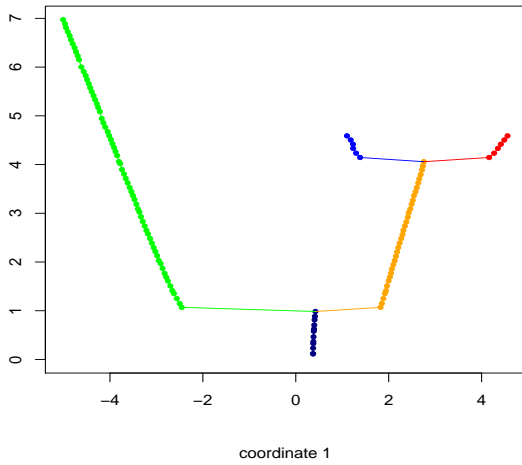
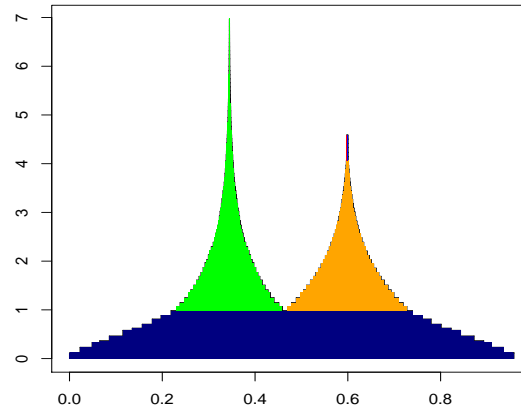
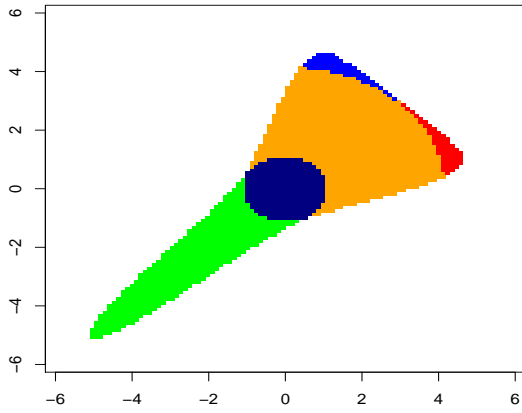
(1) A level set tree is a recursive approximation of a function, (2) a shape tree is a recursive approximation of a set, (3) a tail tree is a tree of data points.



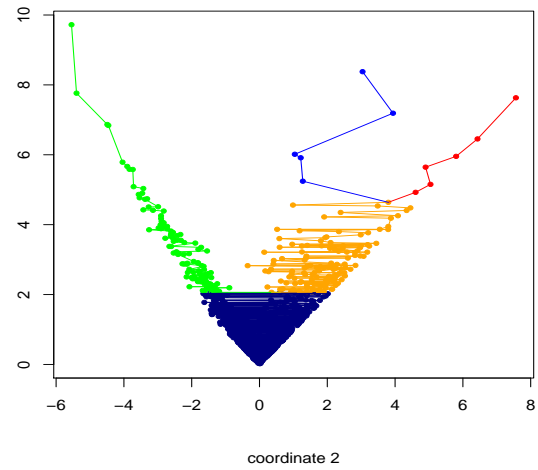
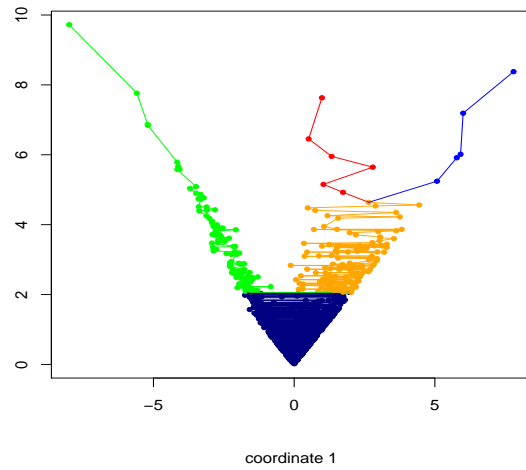
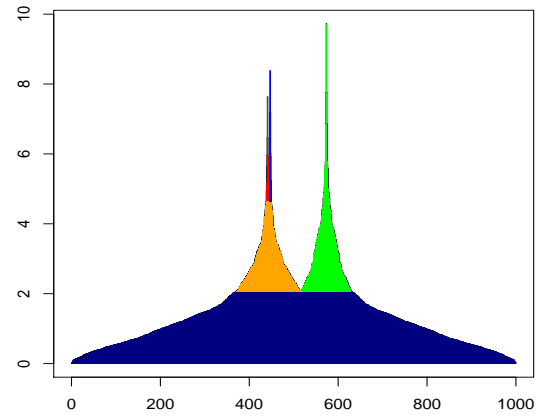
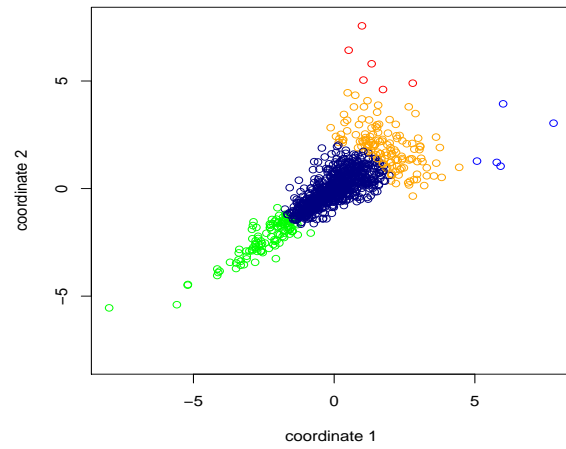
Visualization of a function



Visualization of a set



Visualization of data



Summary

- Level set trees and contour trees have been previously used
 - as a user interface for the visualization of $3D$ level sets,
 - as a data structure for fast extraction of isosurfaces.
- New tools (implemented in package “denpro”):
 - shape isomorphic transforms are defined,
 - spatial trees are used in visualization,
 - sets and data are visualized, in addition to functions.

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