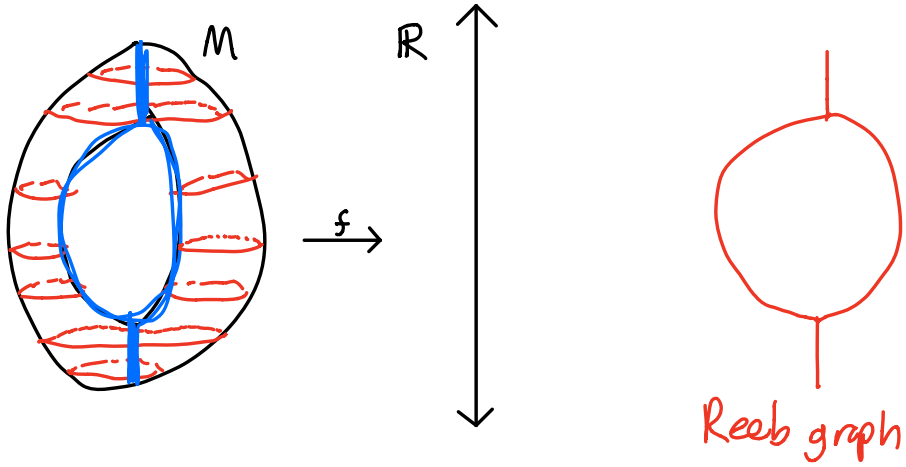
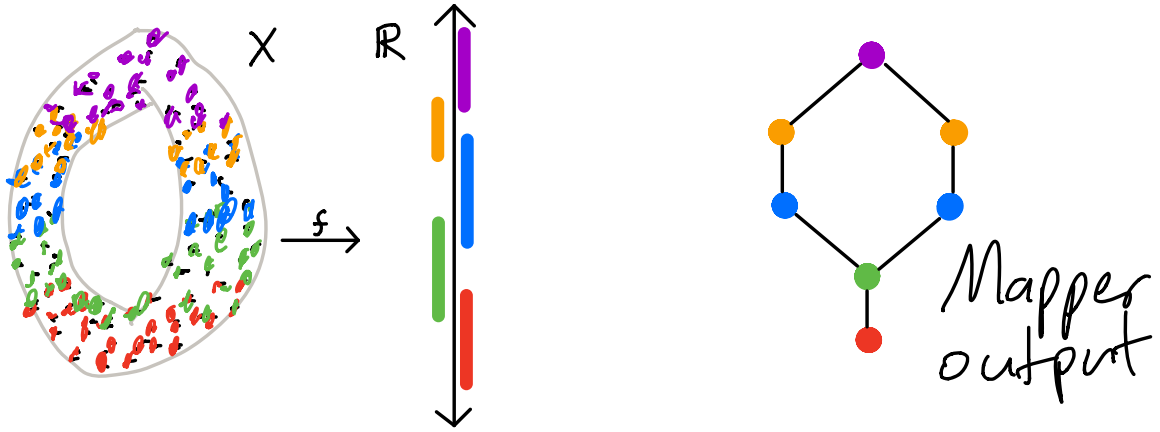
Reeb Graphs and Mapper

"Topological methods for the analysis of high dimensional data sets and 3D object recognition"
by Gurjeet Singh, Gunnar Carlsson, and Facundo Mémoli

Reeb graph Let M be a space.
Let $f: M \to \mathbb{R}$.

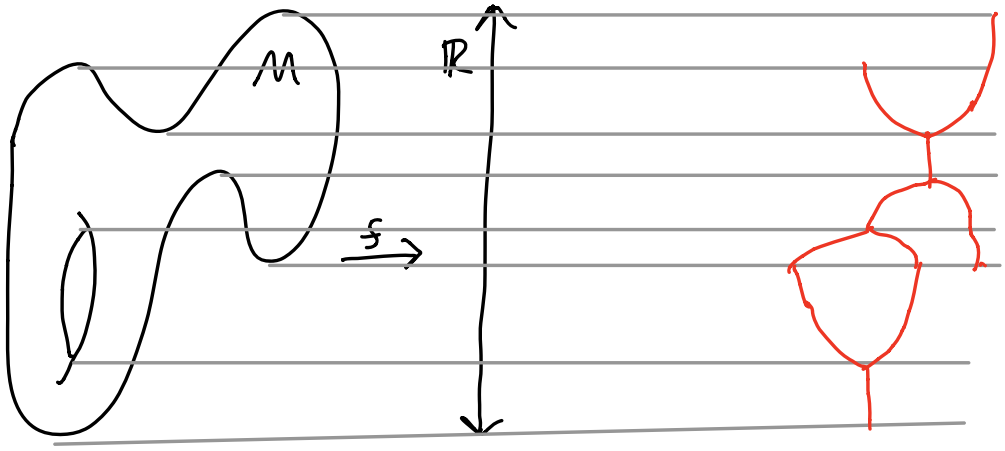


Mapper output Let X be a data set.
Let $f: X \to \mathbb{R}$



Reeb graph

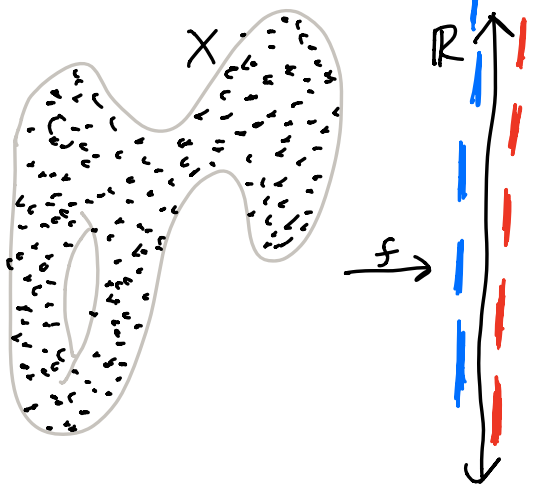
Let M be a space, and let $f: M \to \mathbb{R}$.

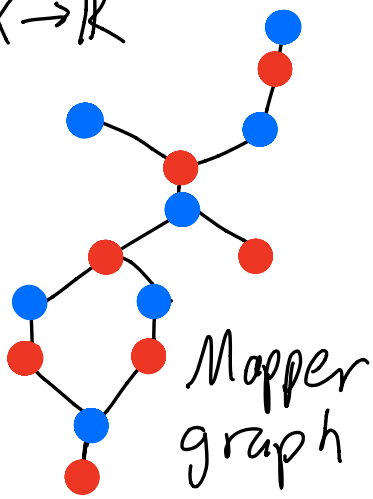


Reeb graph

Mapper output

Let X be a data set, and let $f: X \to \mathbb{R}$





Mapper graph

What should I use for the filtering function f?

- Domain specific: energy, temperature, pressure, intensity, brightness
- General choices: density, eccentricity, graph Laplacians