Topological Data Analysis

3 November 2022

Exercises

1. Let K and L be the abstract simplicial complexes whose maximal faces are, respectively,

   (a) K: (124) (125) (135) (136) (146) (234) (236) (256) (345) (456);

   (b) L: (014) (015) (023) (027) (035) (047) (126) (128) (148) (156) (236) (278) (346) (348) (358) (467) (567) (578).

   Prove that the geometric realizations $|K|$ and $|L|$ are compact surfaces, and find out which surfaces they are.

2. List the maximal faces of the Čech complex $C_\varepsilon(X)$ and the Vietoris–Rips complex $R_\varepsilon(X)$, depending on ε, if X is the set of vertices of a regular hexagon of radius 1.

Please deliver through Campus Virtual as a pdf file before November 10 at 10:00.