



TOPOLOGY SEMINAR

From filtered complexes to matroids to cobordisms: an unlikely story in three parts

By

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Abstract: Our story starts with a question in data analysis and computational topology/geometry. Given a finite sample of points from an unknown manifold embedded in an affine space, how can we extract information about topological invariants of the said manifold? Even though the answer is known for a long time, the connections of the question with computational geometry and data analysis have only recently been made. We will review these connections, and then move on to the "representation problem" of homology of filtered complexes. Specifically, we will explain why "bar-codes" are enough for filtered complexes over reals, but why there is no such hope for other seemingly nice posets. Then we will talk about why matroids and cobordisms (of spheres) might naturally provide us the necessary tools for devising a solution for this problem.

Date: Apr 5, 2021

Time: 13:30 UTC+3

Place: Zoom

To request the event link, please send a message to cihan.okay@bilkent.edu.tr