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Theoretical Exercise 3

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Exercise 1   Geodesic Distance

Given is a triangle with the 2D points $x_1 = (3, 4)^T, x_2 = (5, 2)^T, x_3 = (1, 1)^T$. We already know the distances $d_1 = 2, d_2 = 1$. What is d_3?

Exercise 2   Shape Distances

Give an example of three point clouds, where the triangle inequality is not fulfilled for the Chamfer distance.

Exercise 3   Histogram Distances

You are given two datasets of shapes P and Q, where each shape is represented by a shape descriptor (we ignore questions of transformation invariance). Assume we want to know how similar these datasets are. What measures do you know for this? What are the benefits and downsides?