Computational Geometry for Uncertain Data

(Abstract of Keynote Talk)

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Abstract. The talk will review recent results and algorithmic challenges for computational geometry problems in the context of uncertain data. This is an active area of investigation in the database community, and we introduce it through the specifics of the maximal elements problem (called the skyline problem in the database community): Rather than being a point, an uncertain object is a set of points called instances, each with an associated probability; instances of the same uncertain object can be geometrically far from each other, and are mutually exclusive (i.e., at most one of them can occur). For this version of the maximal elements problem, the input is a collection of m uncertain objects, whose total number of instances is n , and the problem is to compute for each of these n instances the probability that it is a maximal point, i.e., that it occurs for its own object and is not dominated by any occurring instance from another object.