

Learning varieties from samples

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In this workshop we will address a fundamental problem at the interface of data science and algebraic geometry. Given a finite sample of points from an unknown variety V in \mathbb{R}^n , our task is to learn as much information about V as possible. We will try to answer questions such as:

What is the dimension of V ?

What polynomials vanish on V ?

What is the degree of V ?

What are the irreducible components of V ?

What are the homology groups of V ?

We will go take a look at many existing methods - various dimension estimates, persistent homology and others.