Useful when a space is not fixed but depends on the scale of the observation

Gunnar Carlsson

TDA -> persistent homology -> homology -> (simplicial) complexes

TDA -> distance function

Sort of combine geometric and algebraic topology

Persistent Homology:

Function f, sort of resolution / level of detail?

Non-decreasing for face – simplex relationship

Filtration level of K by function f: K \mapsto R^+

Induce abelian group homomorphisms, can be regarded as Z module homomorphisms?

f\_{p}^{i,j}: H\_{p}(K\_{i}) \mapsto H\_{p}(K\_{j})

Persistent homology groups: Im(f\_{p}^{i,j}), for each p,I,j

Persistent Betti numbers: rank

Persistent module: //TODO

Persistent diagram / barcode: how "long" a particular feature "lasts", sort of.

Application: Image, time series data, geology (what type of data?)

STL file

Solid name

facet

normal *ni nj nk*

outer loop

vertex *v*1*x* *v*1*y* *v*1*z*

vertex *v*2*x* *v*2*y* *v*2*z*

vertex *v*3*x* *v*3*y* *v*3*z* endloop

endfacet

endsolid name

3d printing machine constructs by drawing contours for increasing z's

Normally, first create slicing file