javaPlex — a research platform for persistent homology

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javaPlex history

Stanford software packages for persistent homology and topological data analysis:

2000–2006  Plex
            C++ with Matlab bindings
            Vin de Silva, Patrick Perry.

2008–2010  jPlex
            Java – for easier Matlab integration
            Harlan Sexton, Mikael Vejdemo-Johansson, Henry Adams.

2010–      javaPlex
            Java – for easier extension and development
            Andrew Tausz, Mikael Vejdemo-Johansson, Henry Adams.
Persistent homology

- Point cloud data \textit{generates}...
- Filtered simplicial complex \textit{computes}...
- Persistent homology groups \textit{described by}...
- Barcode pictures \textit{encoding}...
- Estimated topological features
Vietoris-Rips complex
Vietoris-Rips complex
Vietoris-Rips complex
Vietoris-Rips complex
Witness-complex

MVJ, AT, HA (Stanford, U of St Andrews)
Image patches
Image patches
Image patches
Image patches
Interoperability

- Matlab
- Jython
- Processing (see GTS demo session!)
- Mathematica
- Scala
- ... anything JVM really