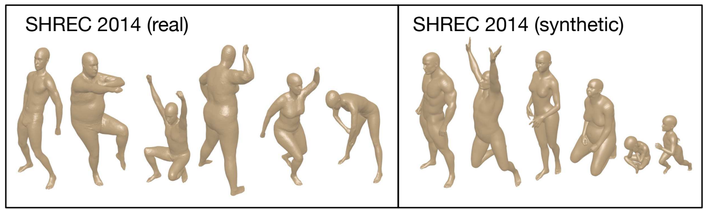
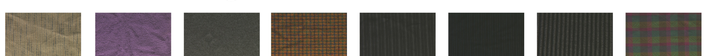
Shape classification



Meshes represented as simplicial complex; filtered by heat kernel signature

Texture recognition

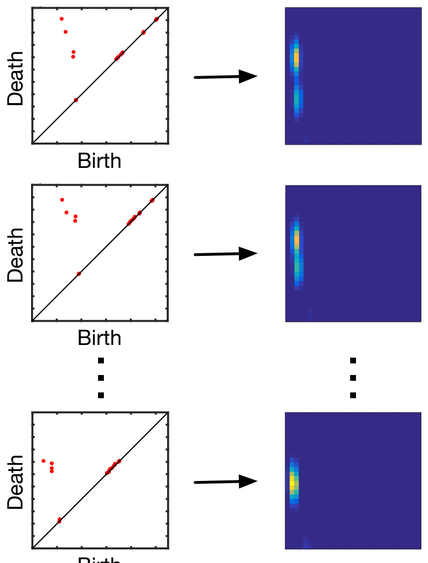


Images represented as cubical complex; filtered by sign component of complete local binary pattern

Persistent homology

Persistence diagrams

Persistence images



$$\mathbf{X} = \begin{bmatrix} \mathbf{x}_1 & \mathbf{x}_2 & \cdots & \mathbf{x}_n \end{bmatrix}_{m \times n}$$

Sparse sampling

Select *s* optimal measurement locations in *m*-dim space

$$\mathbf{X} = \begin{bmatrix} \mathbf{x}_1 & \mathbf{x}_2 & \cdots & \mathbf{x}_n \end{bmatrix} \quad l_1, l_2, l_s$$

$$\tilde{\mathbf{X}}_{s \times n}$$

$$s << m$$

SVM
LDA