Spectral relaxations of persistent rank invariants

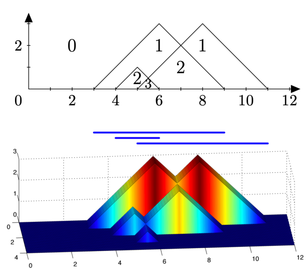
With a focus on *parameterized* settings

Matt Piekenbrock[†] & Jose Perea[‡]

Vectorizing diagrams

There are many mappings from dgm's to function spaces (e.g. Hilbert spaces)

- Persistence Landscapes (Bubenik 2020)



$$\lambda(k,t) = \sup\{h \geq 0 \mid \mathrm{rank}(H_p^{i-h} \to H_p^{i+h}) \geq k\}$$

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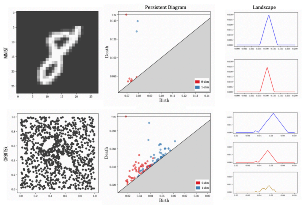

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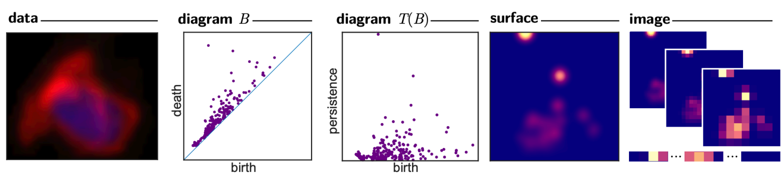

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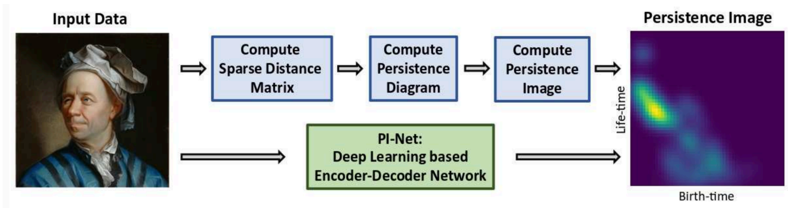

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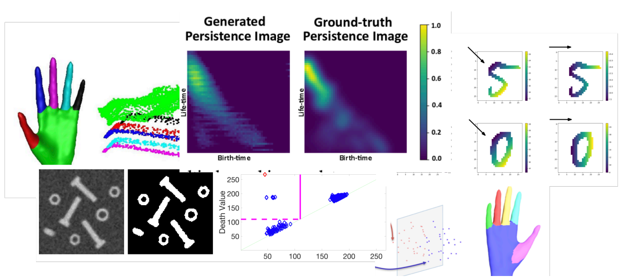
A few others...[1]



[1] See (Bubenik 2020) for an overview.

Many goals in common...

- Vectorize persistence information
- Optimize persistence invariants
- Leverage the stability of persistence
- Connect to other areas of mathematics