

Cocoon Microstructures through the Lens of Topological Persistence

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Biological materials display various functionality, often dictated by complicated microstructures. Studying the complex structure of silk-worm cocoons can give inspiration to new bio-mimetic engineering applications.

Developing of new geometric and topological strategies enables us to describe the microstructures precisely and systematically. The silkworm cocoon is an example of a complex microstructure, producing a complicated entangled material.

This poster on the microstructural analysis of *B. mori* silkworm cocoon using three-dimensional voxelised (μ CT) scans. We approach this data through the lens of persistent homology to derive conclusions about pore size gradients and fibre thickness gradients. Analyzing the fiber alignments we demonstrate the uniform fiber orientations.