Connecting the "Dots": Topology Optimization for Fiber-Reinforced Composites
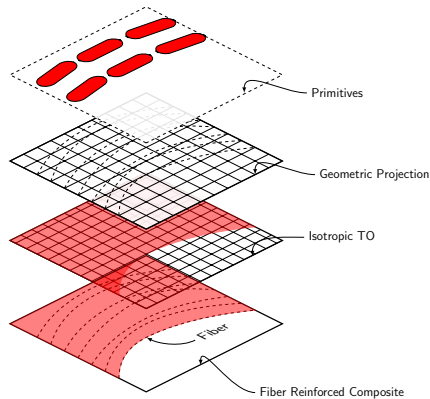
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Simultaneous Fiber & Composite Topology Optimization

Primitives

Geometric Projection

Isotropic TO

Fiber

Fiber Reinforced Composite

Topological

Computing Topological sensitivity field to locate optimal fiber

$$\psi(\Omega) = \frac{1}{2} \int_\Omega \sigma(\mathbf{u}) \cdot \varepsilon(\mathbf{u})$$

$$TD(\hat{x}) = \lim_{\epsilon \to 0} \frac{\psi_\epsilon(\Omega) - \psi(\Omega)}{f(\epsilon)}$$

Flow