Understanding Anisotropic Highlights for Interactive Appearance Editing
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Understanding Anisotropic Highlights for Interactive Appearance Editing

**Goals**

- Understand the shape of **anisotropic highlights** on arbitrary objects
- Infer local **BRDF orientations** from user-specified highlight shapes

**The shape of anisotropic highlights**

Highlight tangent field depends on variations...
... of **BRDF orientations** (geodesic curvature & splay)
... of **surface normals** (directional curvature & torsion)

Our non-linear solver optimizes BRDF orientations \( \varphi \) to yield the desired highlight tangent field \( \ell \)

**Highlight manipulation tools**

- **Warp tool**: Deform the highlight tangent field to deviate trajectories of highlight curves
- **Light tool**: Retrieve a light source given a point/tangent constraint for the highlight curve
- **Stencil tool**: Paint a degenerate highlight region that quickly vanishes when lighting is rotated

**Additional results**

- **Brushed steel**, **Satin fabric**, **Brushed bronze**
  - Top/bottom row: initial/edited highlights. Manipulations are preserved across material changes.
  - Manipulated highlights are preserved even in complex scenes rendered with global illumination.

**Conclusions**

- Provide **explicit relations** between highlights, lighting and surface properties.
- Future work: investigate **relevance** of highlight tangent formula to Human Vision.