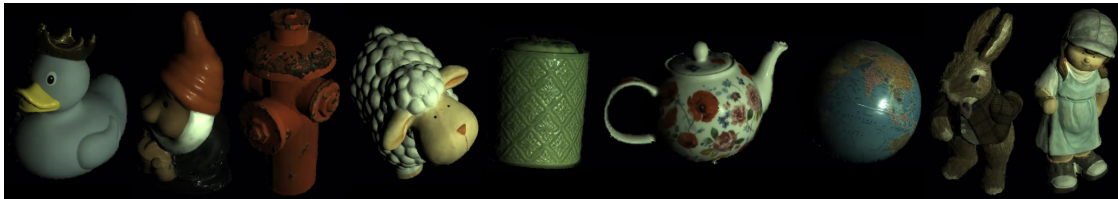


## On Joint Estimation of Pose, Geometry and svBRDF from a Handheld Scanner

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Input Images



Observation



Reconstruction

$$\mathcal{X} = \left\{ \begin{array}{c} \text{Geometry} \\ \text{Normals} \\ \text{Appearance} \\ \text{Camera Poses} \end{array} \right\}$$

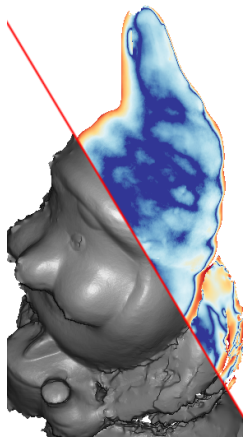
The figure illustrates the components of a scene representation  $\mathcal{X}$ . It is defined as a set containing four elements: Geometry (a purple 3D model of a gnome), Normals (a 3D model of a gnome with a color gradient representing surface normals), Appearance (a 3D model of a gnome with a brown hat and white beard), and Camera Poses (a 3D coordinate system with a red arrow labeled  $[R|t]$  indicating the camera's position and orientation).

$$\mathcal{X}^* = \underset{\mathcal{X}}{\operatorname{argmin}} \mathcal{L}(\mathcal{X})$$

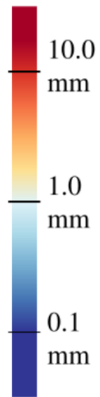




Meaningful Segmentation

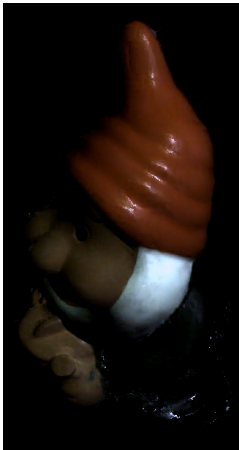


Accurate Geometry





Relighting



Relighting



Novel Viewpoint



[https://github.com/autonomousvision/handheld\\_svbrdf\\_geometry](https://github.com/autonomousvision/handheld_svbrdf_geometry)

