

# Approximation and Visualization of Surface Uncertainty

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## Introduction

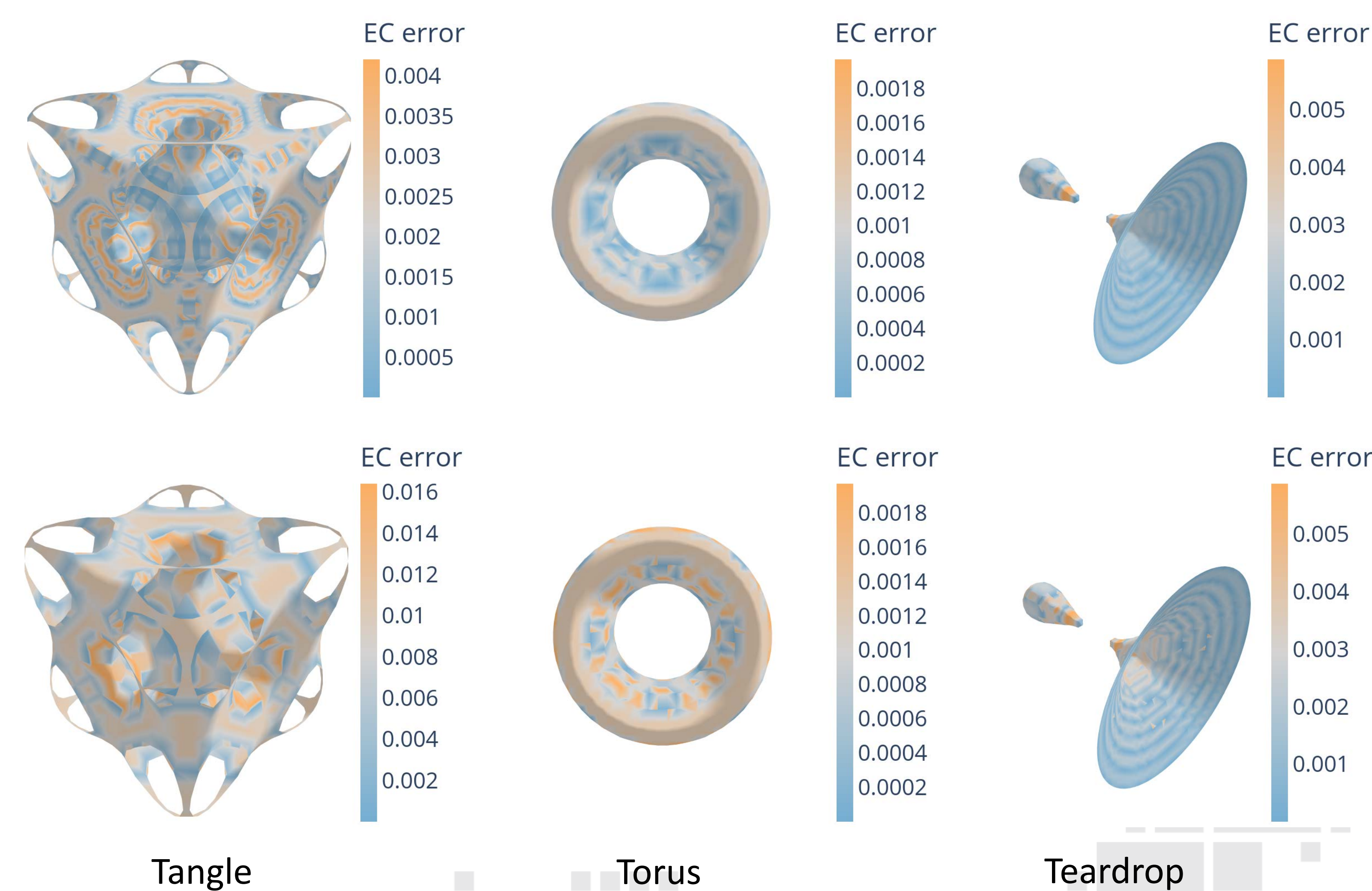
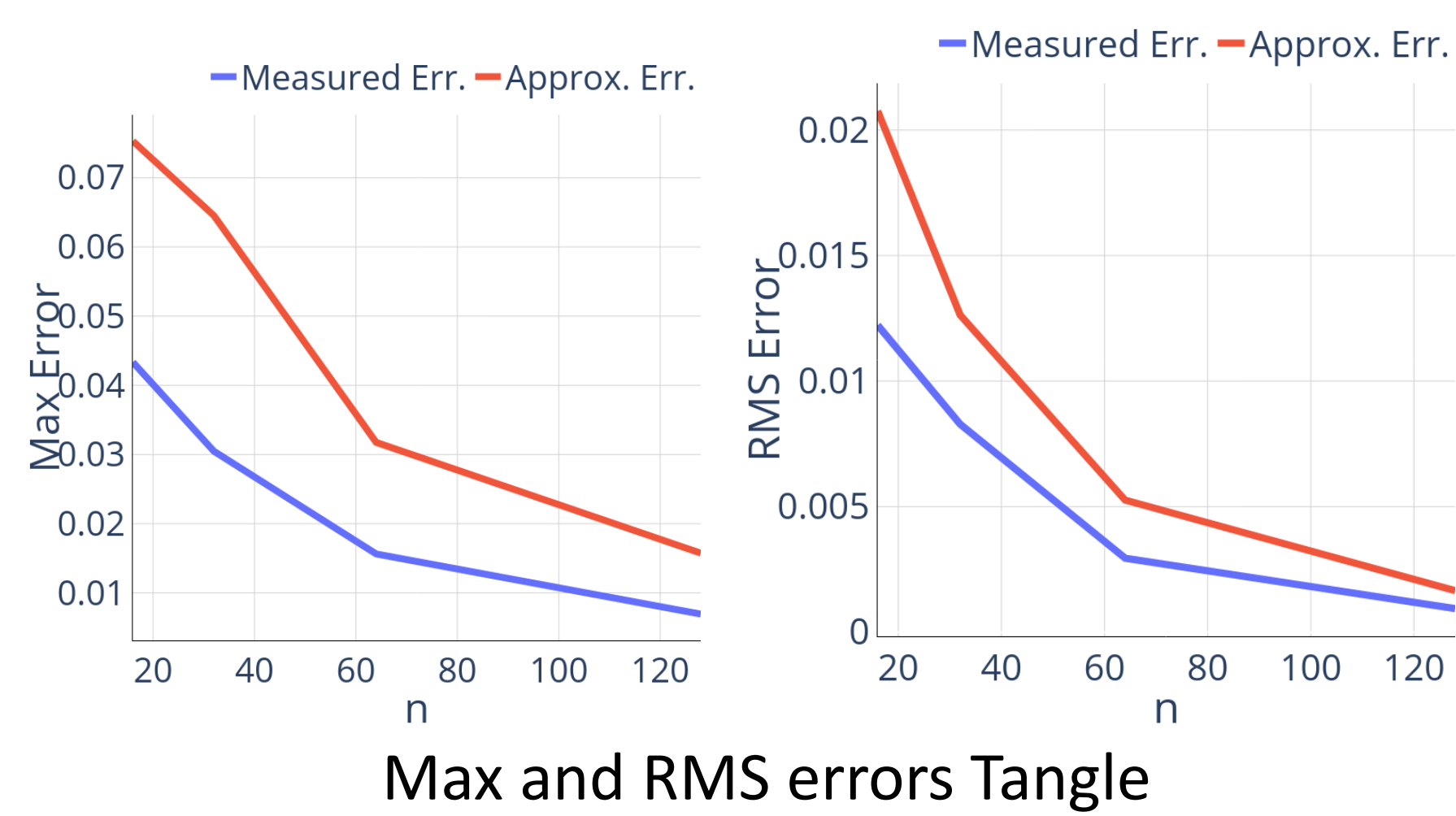
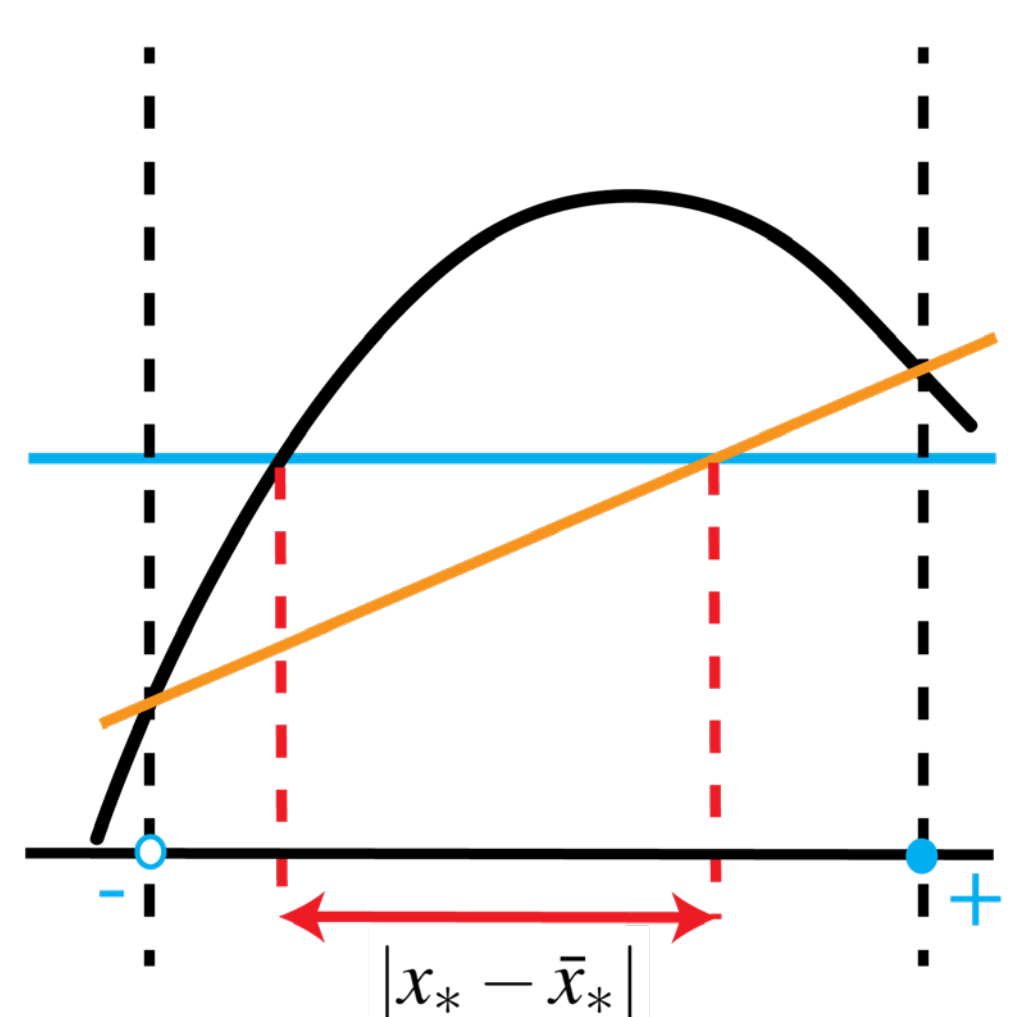
### Motivation

- The omission of surface extraction uncertainty can lead to inaccurate visualizations and may impact subsequent analyses reliant on the extracted surface

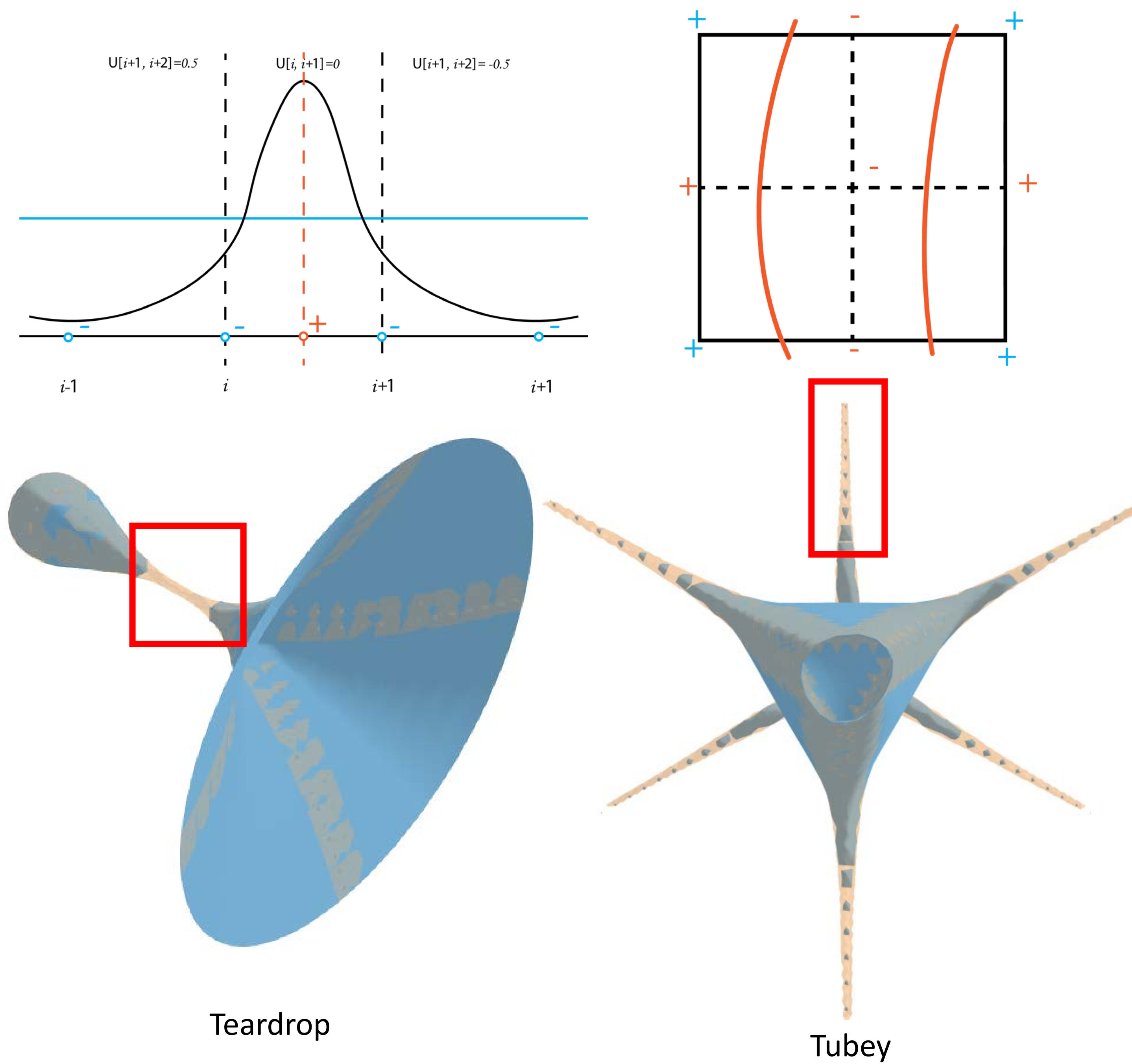
### Goal

- Estimate and visualize surface uncertainty caused by the extraction procedure
- Enable exploration and Analysis of the estimation uncertainty
- Enable comparison of different methods for surface extraction

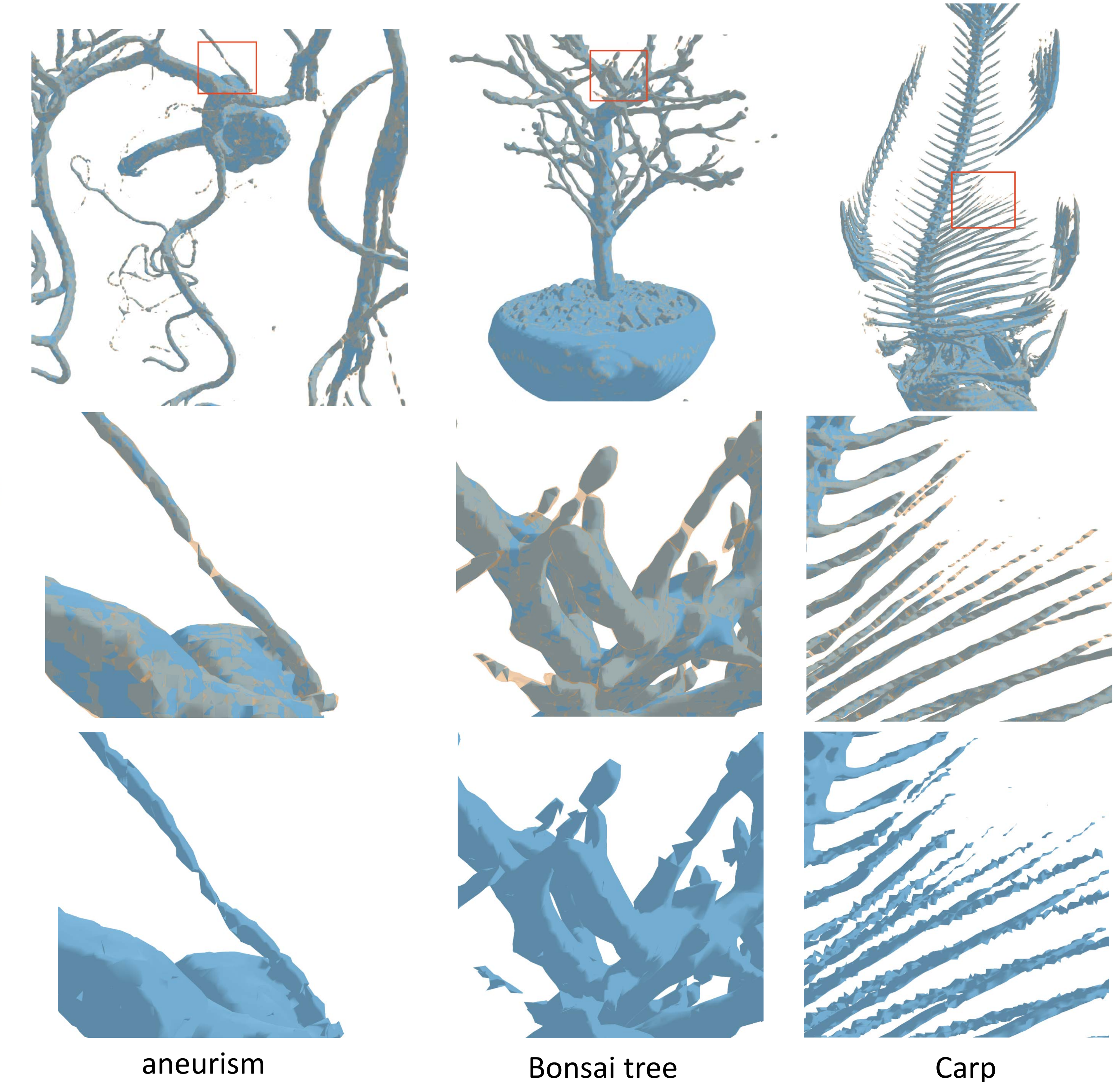
## Edge-Crossing Error



## Feature Uncertainty



## Results



### Isosurface Uncertainty Vis.

Tools: Aprox. Error CDF (Off)

Selection Box: Off

Center: x-axis (0.5), y-axis (0.5), z-axis (0.5)

Dimensions: dx (0.5), dy (0.5), dz (0.5)

Interpolation Method: Selected edges (LINEAR), Unselected edges (LINEAR)

### Tangle

Aprox. Err. visualization of the Tangle model.

Isosurface Comparison: Edge-Crossing (selected), Hidden Features (off)

Local Isosurface Comparison: [L-C] (selected), [L-W] (selected), Aprox. Error (selected)

Summary			
	max	mean	rms
Approx. Err.	9.18E-03	1.83E-03	4.27E-02
[L-C]	7.98E-03	4.63E-04	2.15E-02
[L-W]	8.14E-03	5.76E-04	2.40E-02

	Without Hidden Features	With Hidden Features
Num. Points:	6960	35502
Num. Triangles:	12928	26272
Num. Critical Points:	6960	6960
Num. Connected Components:	6960	6960

Interactive uncertainty Vis Interface