

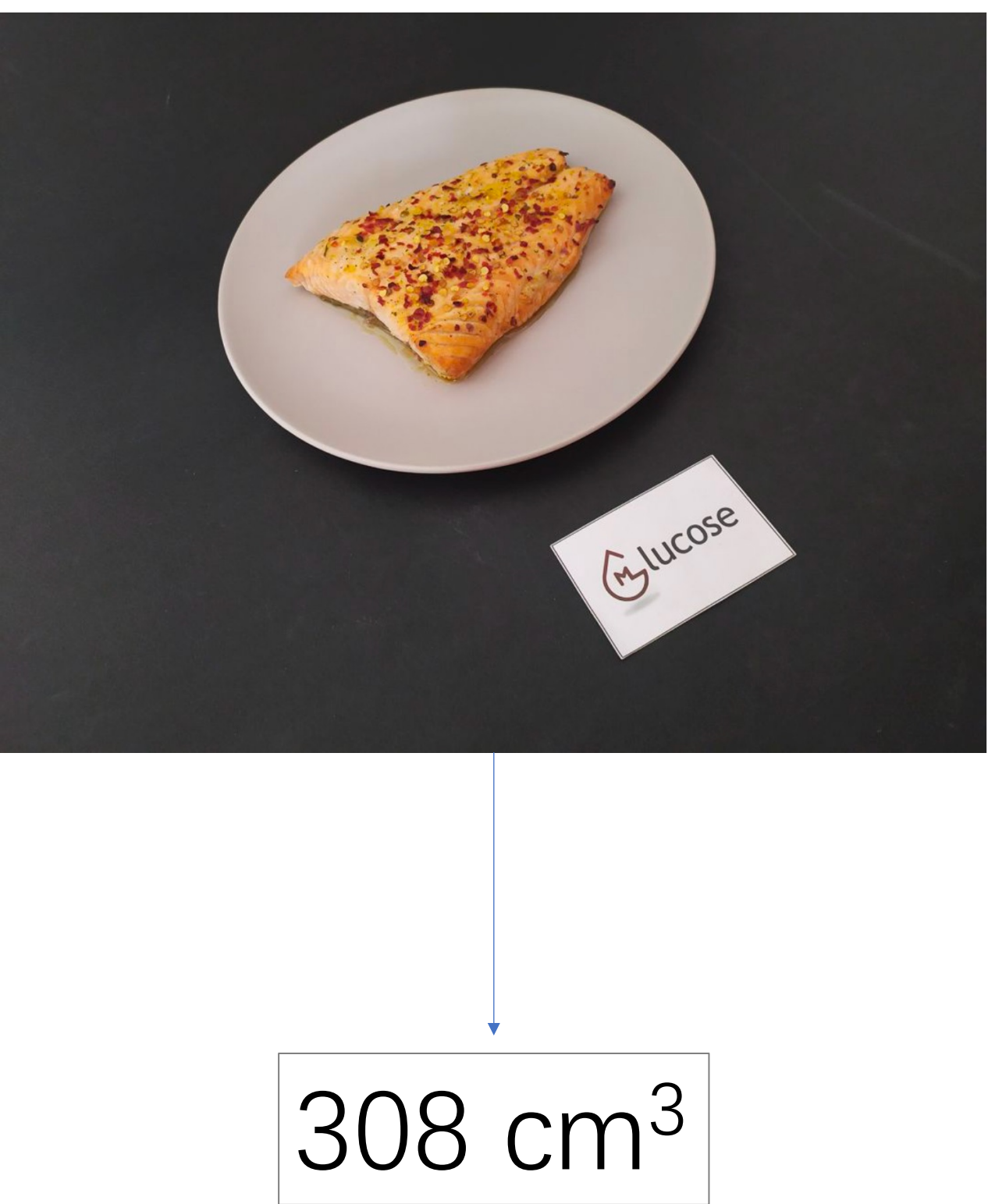
Application of Neural Radiance Field Single-Object 3D Reconstruction Algorithms for Volume Estimation



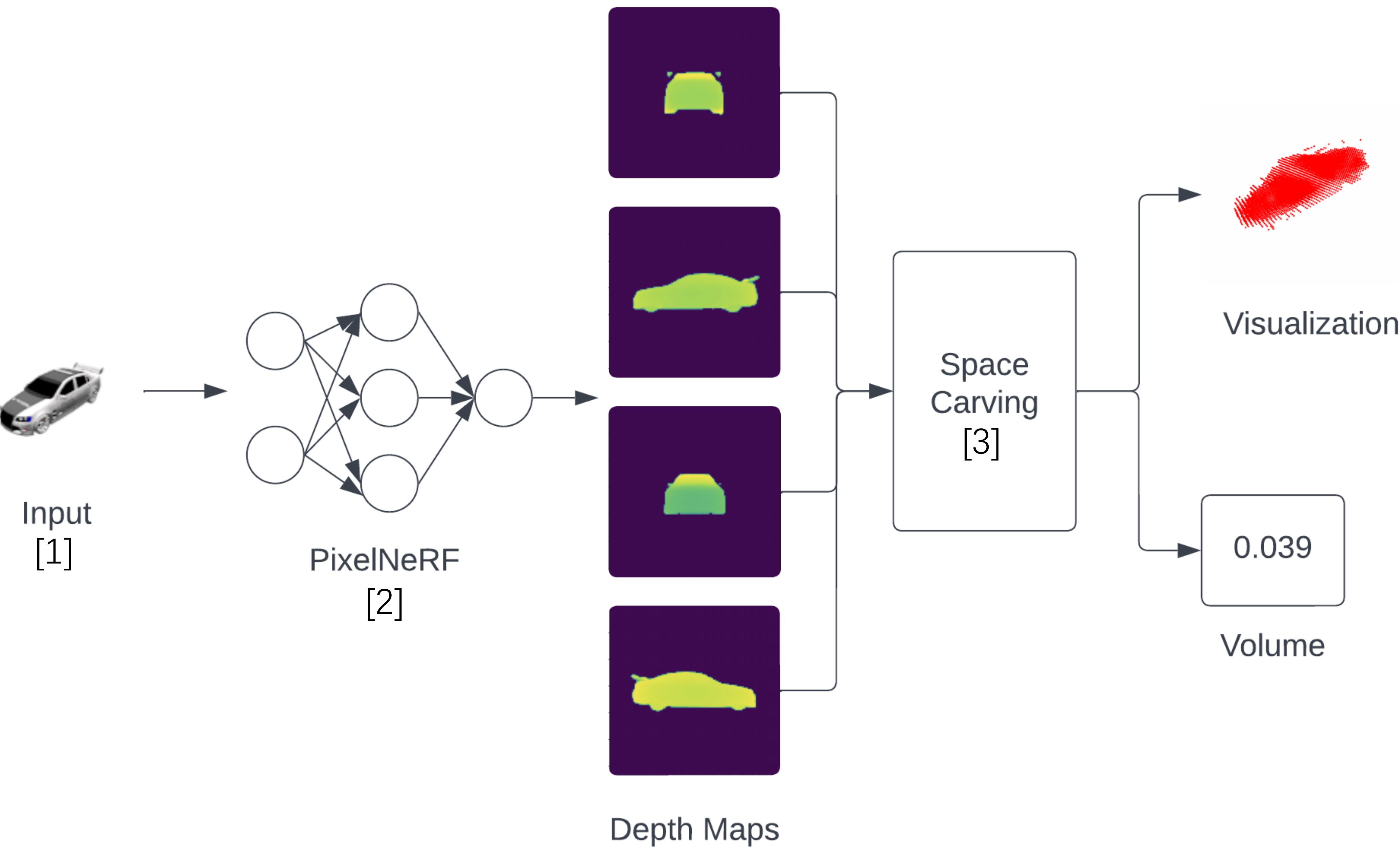
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Motivation

- **Application:** for nutritional tracking
- **Limitation:** require controlled settings, struggle with a diversity of shapes, and need specialized equipment
- **Goal:** bridge the gap to enable precise and convenient volume estimation

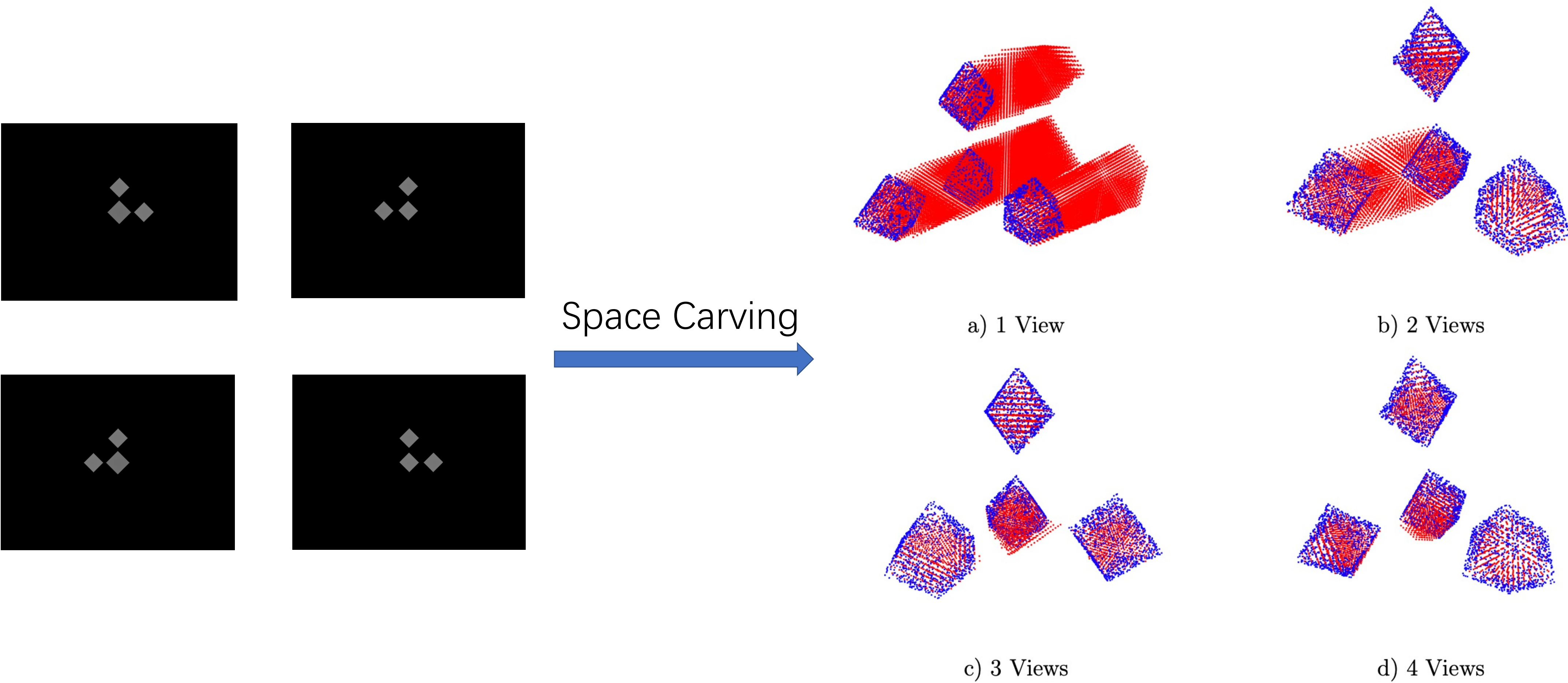


Methodology



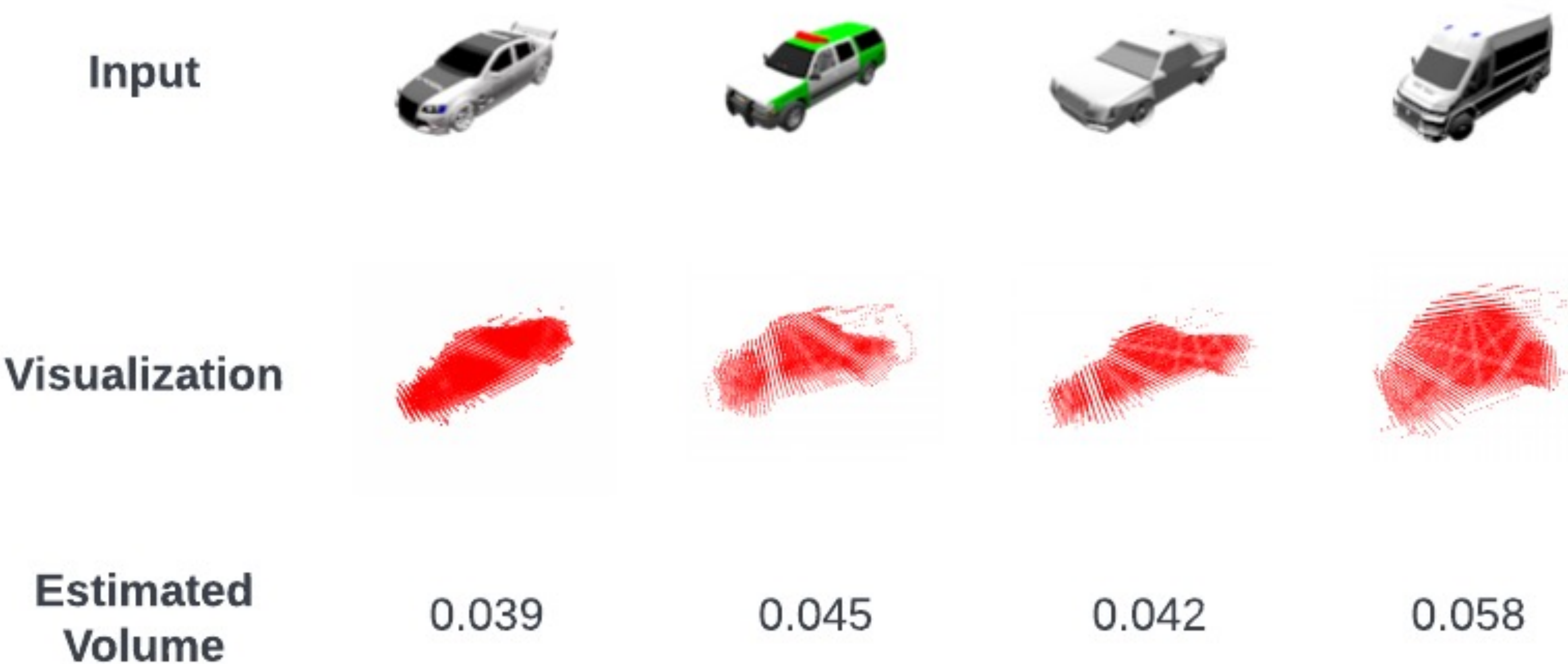
Experiments

Verify Space Carving for Volume Estimation



	Actual Volume	1 View	2 Views	3 Views	4 Views
Result	2.73	20.59	4.94	2.87	2.85

Visualizations From Proposed Pipeline



Future Works

- **Evaluate** the proposed pipeline

[1] Jonathan Krause, Michael Stark, Jia Deng, and Li Fei-Fei. 3d object representations for fine-grained categorization. (2013). In IEEE International Conference on Computer Vision Workshops.
[2] Alex Yu, Vickie Ye, Matthew Tancik, and Angjo Kanazawa. (2021). PixelNeRF: Neural radiance fields from one or few images. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition.
[3] K.N. Kutulakos and S.M. Seitz. (1999). A theory of shape by space carving. In Proceedings of the Seventh IEEE International Conference on Computer Vision.