CWF: Consolidating Weak Features in High-quality Mesh Simplification

Rui Xu, Longdu Liu, Ningna Wang, Shuangmin Chen, Shiqing Xin, Xiaohu Guo, Zichun Zhong, Taku Komura, Wenping Wang, Changhe Tu
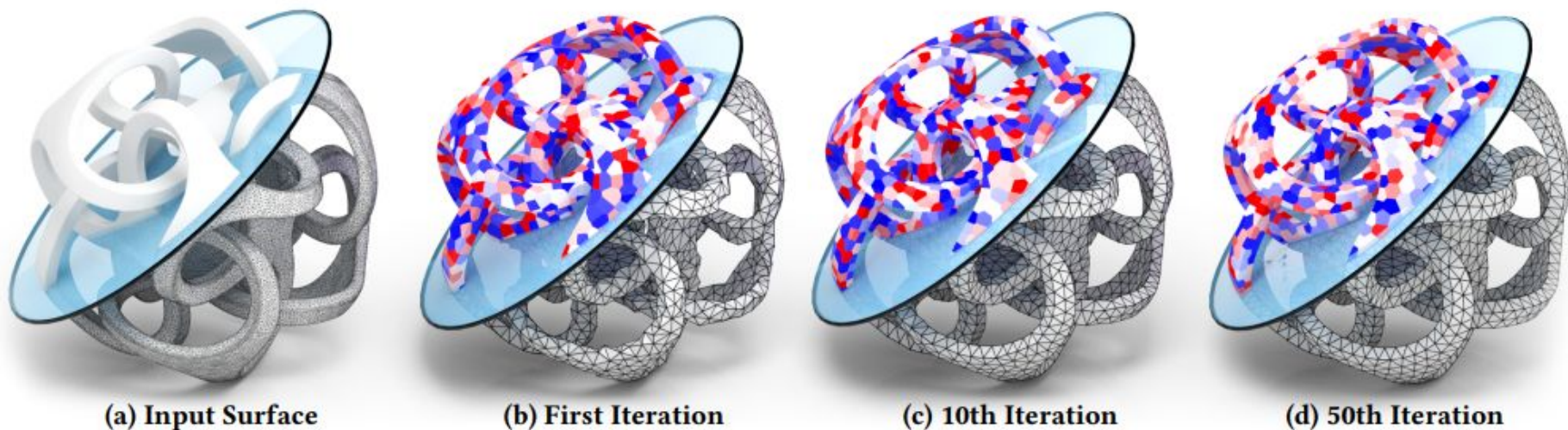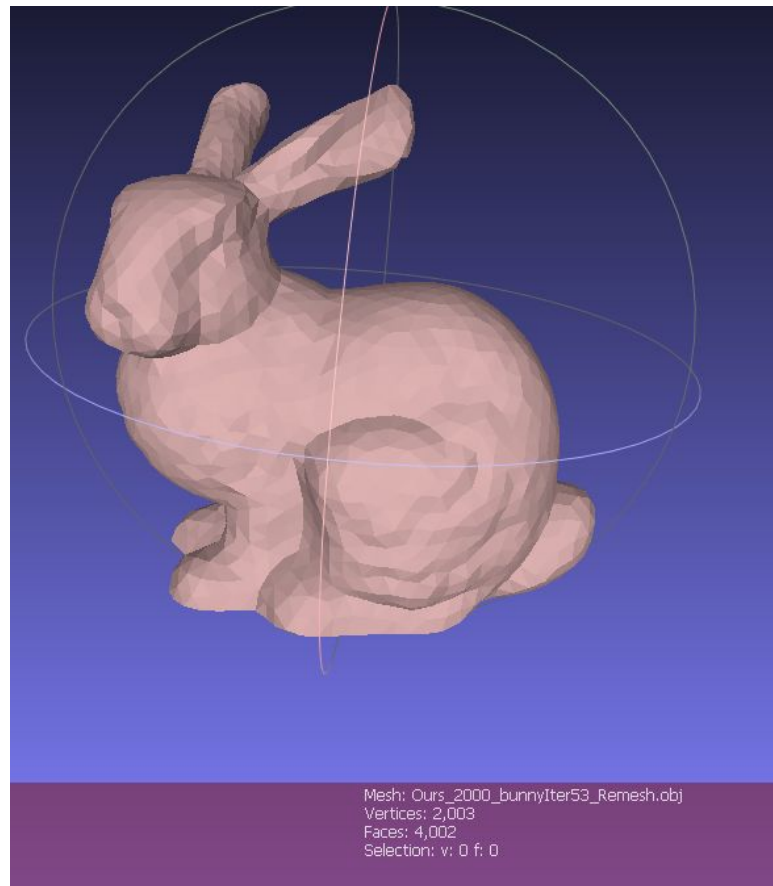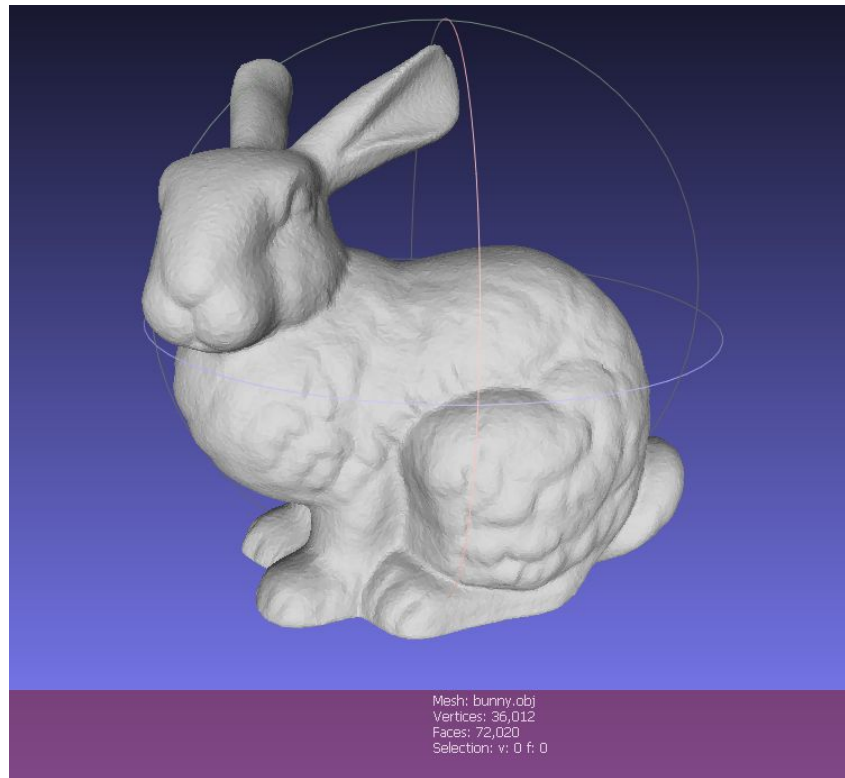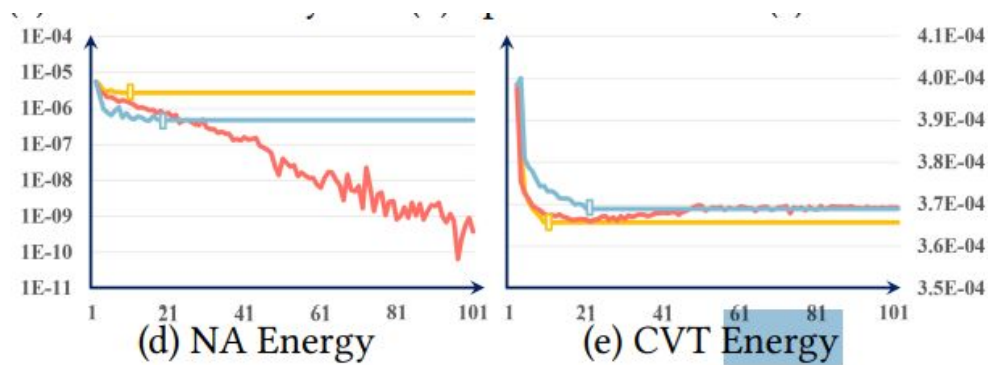
Navya Mishra

What the Paper Does

(a) Input Surface   **(b) First Iteration**   **(c) 10th Iteration**   **(d) 50th Iteration**
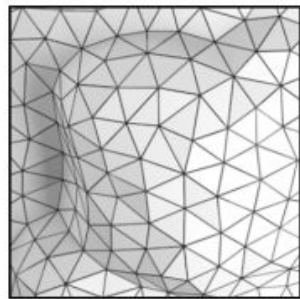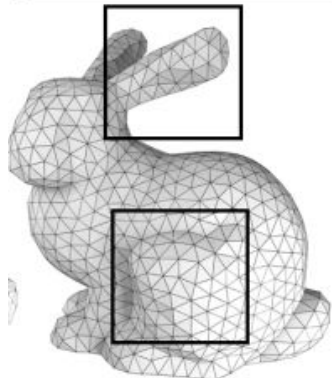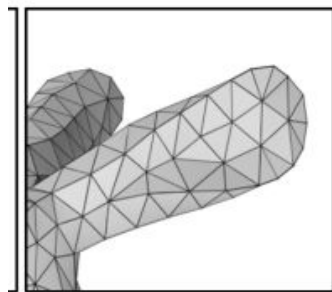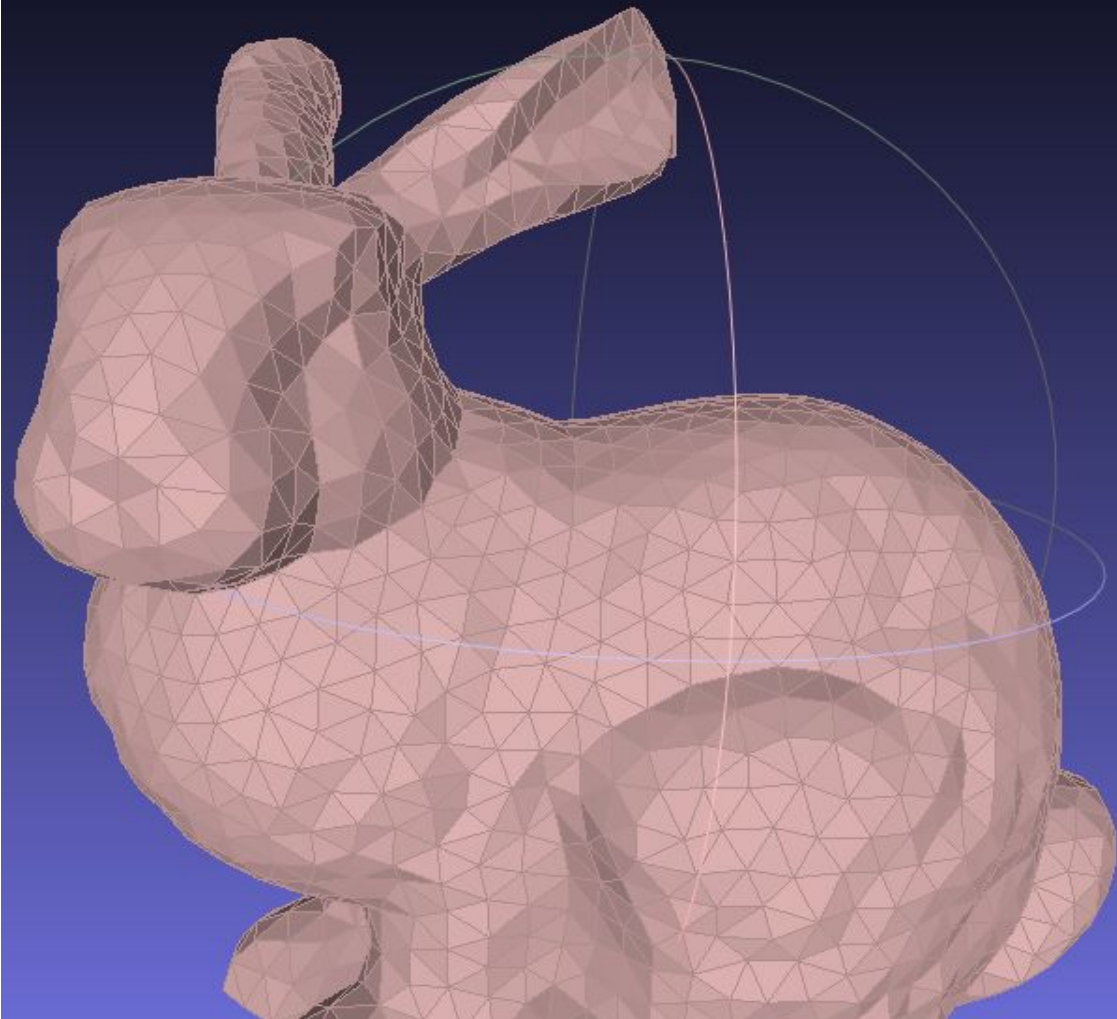
Fig. 2. We present a functional that integrates the demands of accuracy, triangle quality, and feature alignment. The impact of the CVT energy gradually diminishes, thanks to the decaying weight, achieving a harmonious balance between the two terms. It is noted that a Restricted Voronoi Diagram (RVD) must be computed during each iteration. In this example, a total of 50 iterations activated our termination condition.

Reproduced Results

Mesh: bunny.obj
Vertices: 36,012
Faces: 72,020
Selection: v: 0 f: 0

Mesh: Ours_2000_bunnyIter53_Remesh.obj
Vertices: 2,003
Faces: 4,002
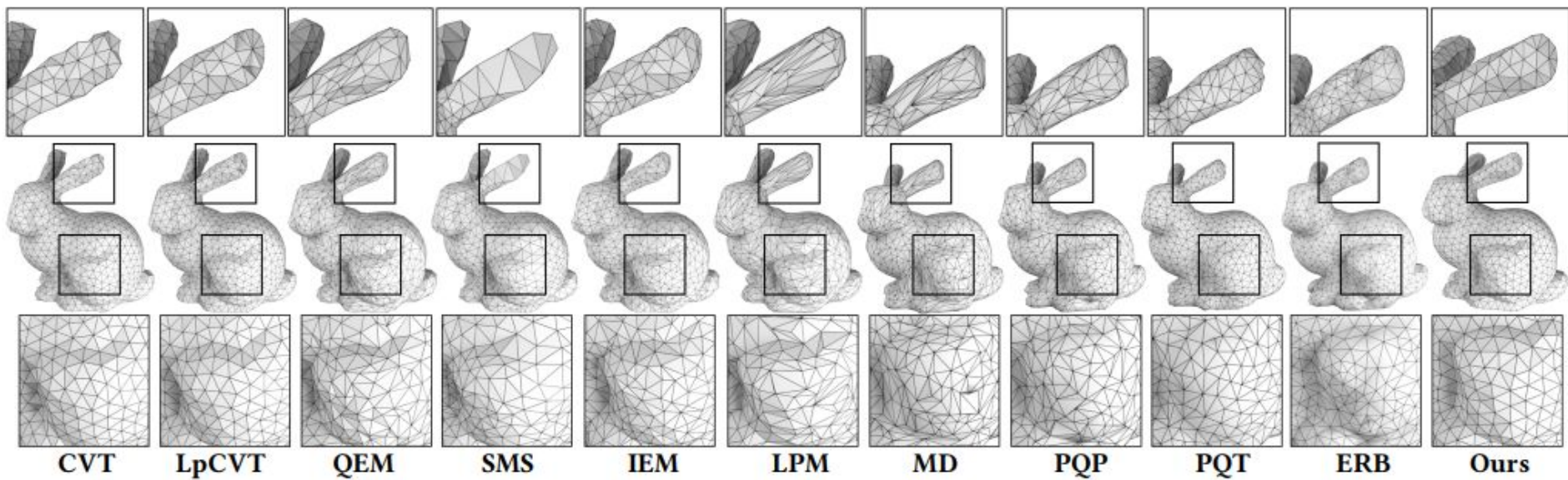Selection: v: 0 f: 0

(d) NA Energy (e) CVT Energy

Ours

Fig. 10. Comparison with state-of-the-art methods on the bunny model using 1000 sample points, demonstrating that our method can more effectively consolidate weak features.

My Extension: Interactive Viewer
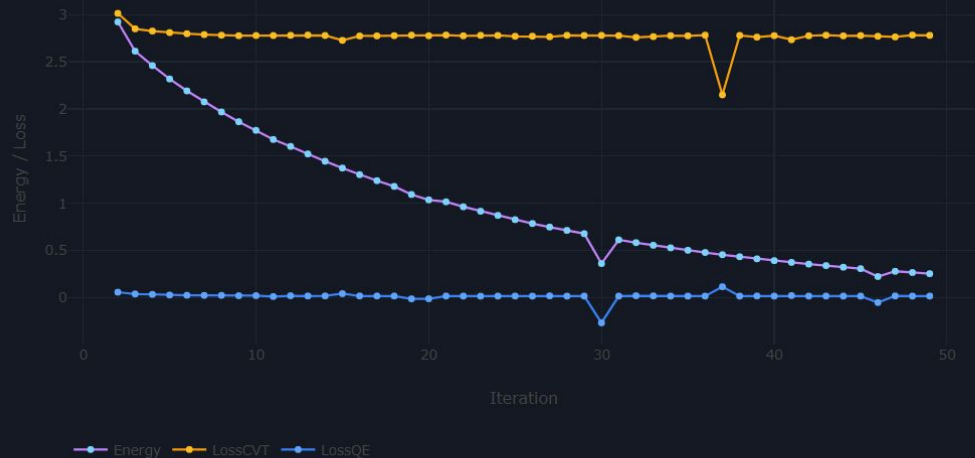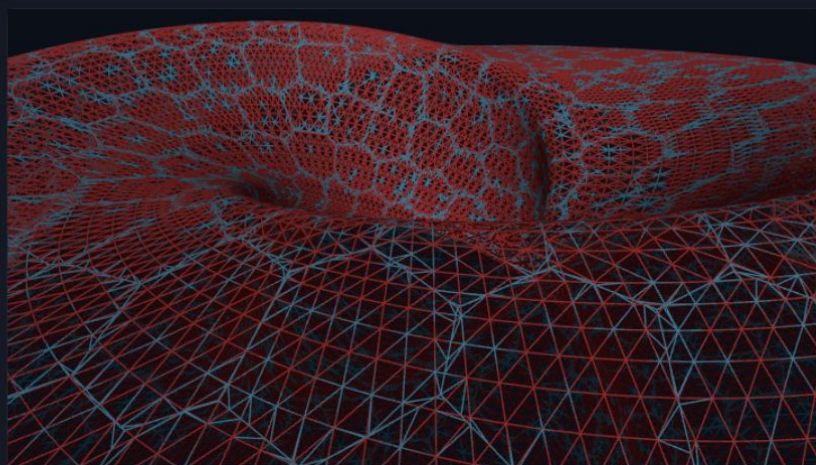
Technical Bits
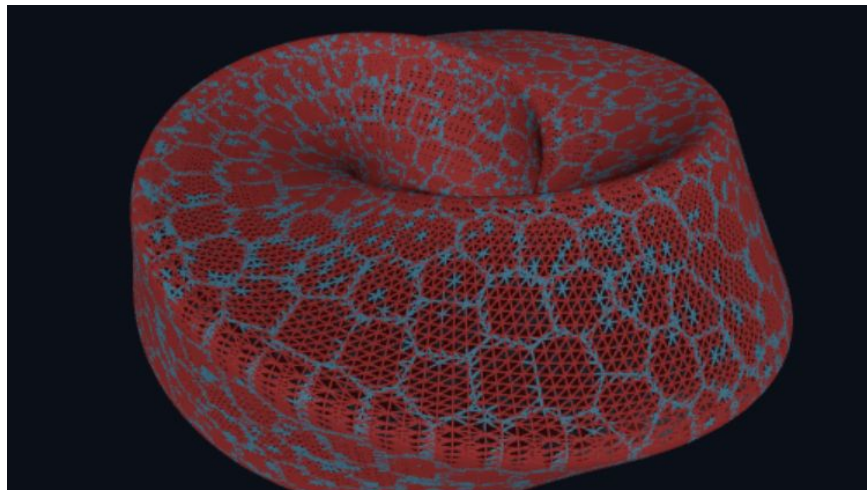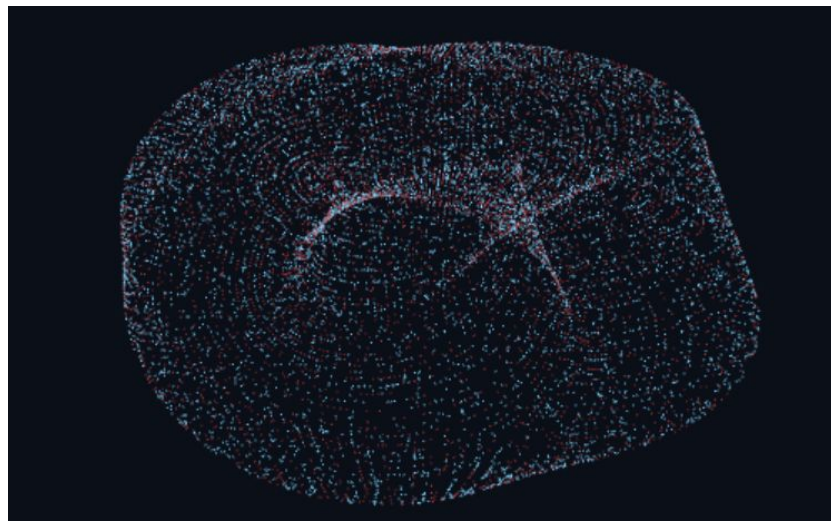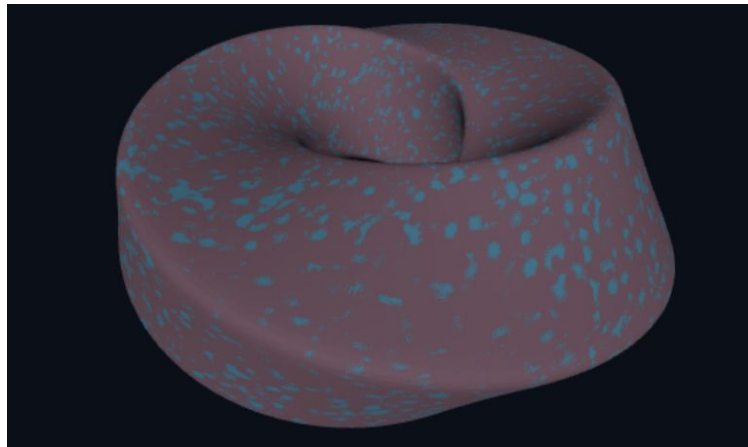
References

Xu, Rui, et al. "CWF: Consolidating Weak Features in High-quality Mesh Simplification." *arXiv*, 2024, arXiv:2404.15661.

Thank you