Motion Graphs for Unstructured Textured Meshes: Supplemental Material

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This supplemental material visualizes results of our Gauss-map smoothing on nine genus-zero models, including the Armadillo (346K triangles), Bimba (150K), Asian Dragon (500K), Bunny (209K), Cow (23K), David (299K), Eurographics Dragon (479K), Wooden Fish (118K), and Gargoyle (428K) models. The visualizations show the results after 0, 1, 2, 4, and 8 iterations of the smoothing process.

The plots in Figure 1 provide a quantitative evaluation of the quality of the smoothed models, measured in terms of the percentage of the model's area that is flipped when mapped to the sphere, the integrated quasi-conformal factor [Kharevych et al. 2006], and the Dirichlet energy of the mapping. For example, for the Armadillo, the mapping is a bijection after seven iterations and has an average quasi-conformal factor of 1.033 which is comparable to the factors obtained using the conformal parameterizations of Springborn et al. [2008] (1.034) and Kazhdan et al. [2012] (1.033) on the same model.

We note that for all models, the iterations monotonically reduce the Dirichlet energy. For five of the models (Armadillo, Bimba, Bunny, David, and Gargoyle), there are no flipped triangles after ten iterations. For three of the remaining models (Asian Dragon, Eurographics Dragon, and Wooden Fish), the percentage of surface area that is flipped after ten iterations is below 0.01% (with 104, 8, and 4 triangles flipped, respectively). And, for the Cow model, the iterations fail to converge to a parameterization over the sphere, with 0.2% of the surface area (71 triangles) remaining flipped after 50 iterations.

References

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KHAREVYCH, L., SPRINGBORN, B., and SCHRÖDER, P. 2006. Discrete conformal mappings via circle patterns. *ACM Trans. Graph.*, 25(2).

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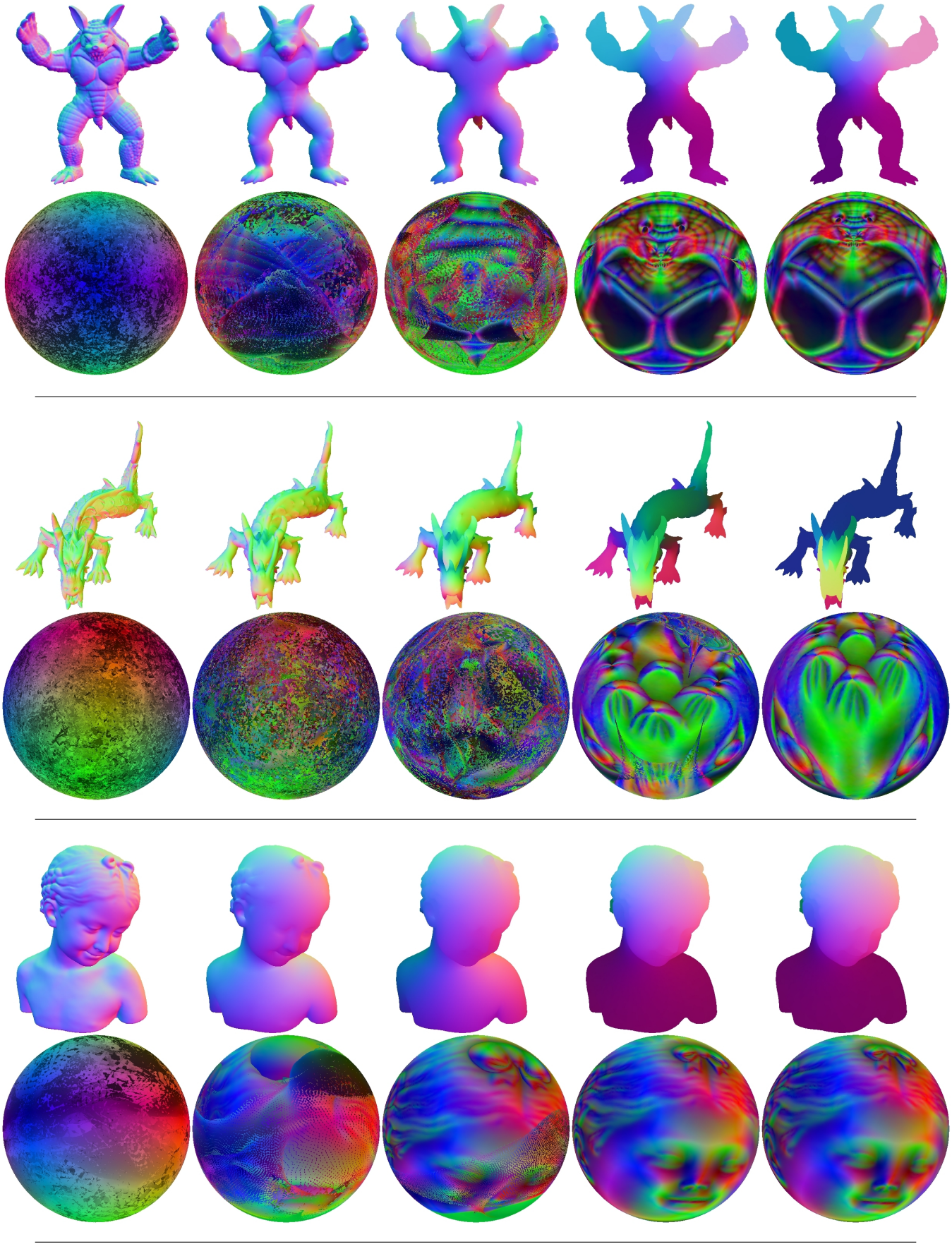

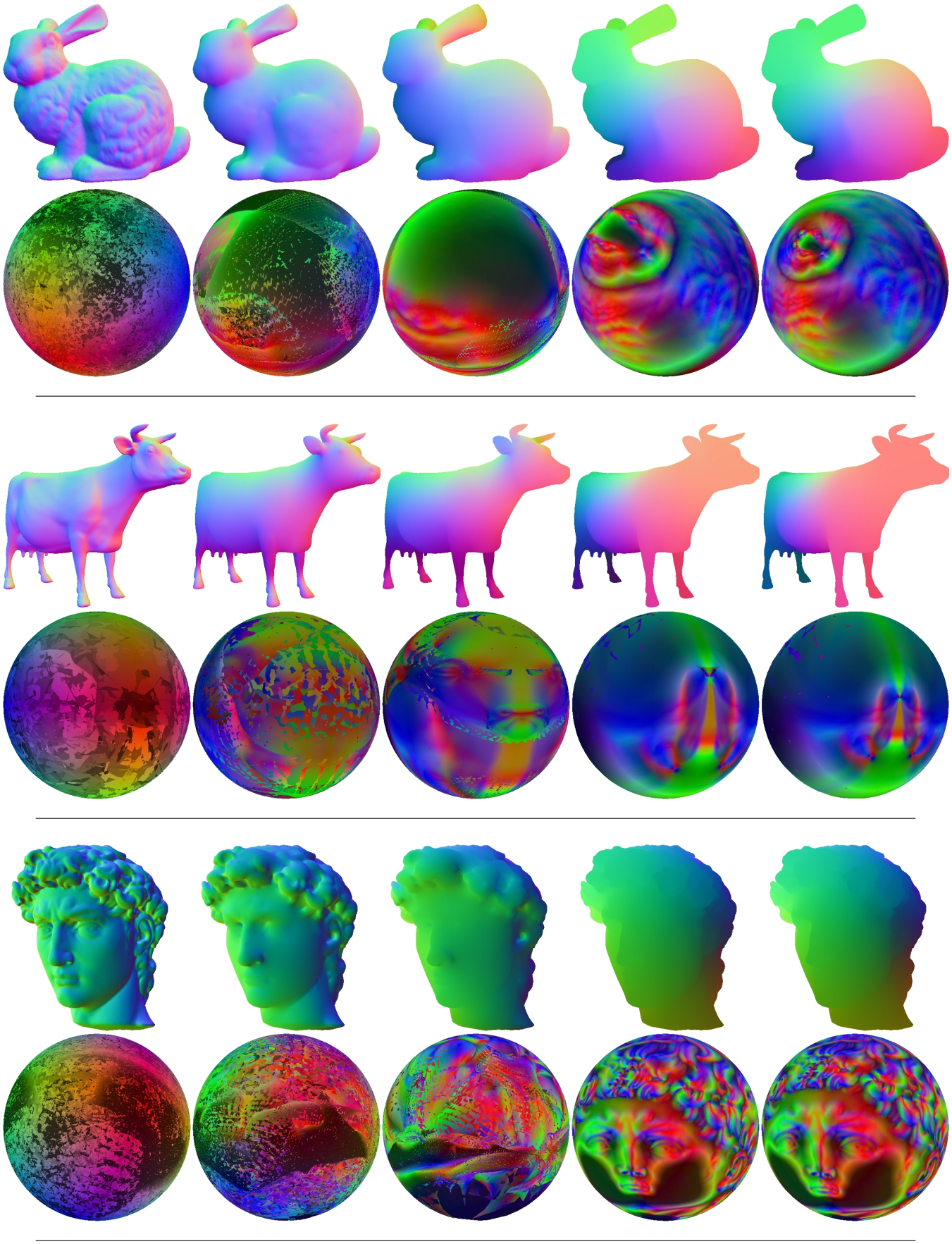

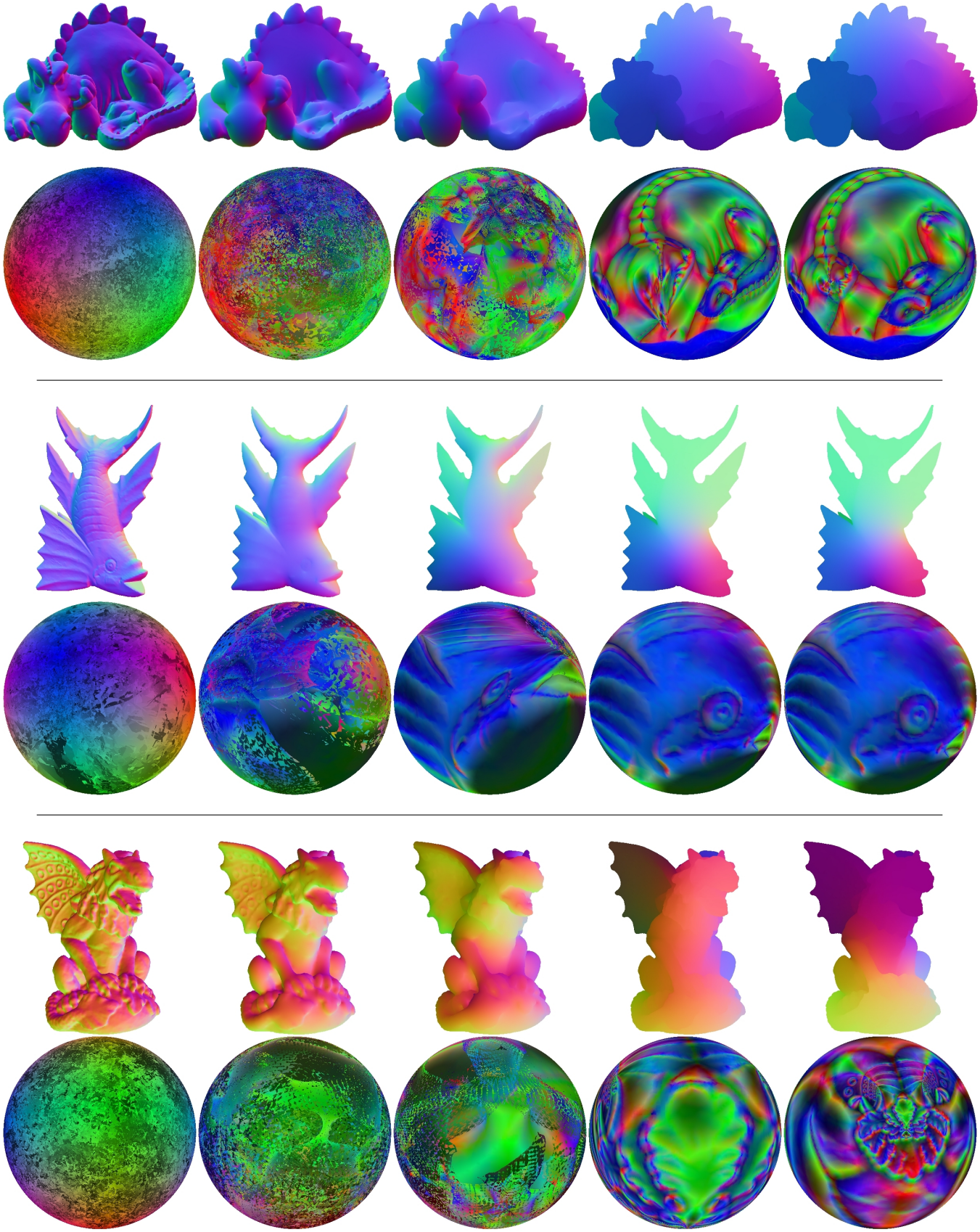

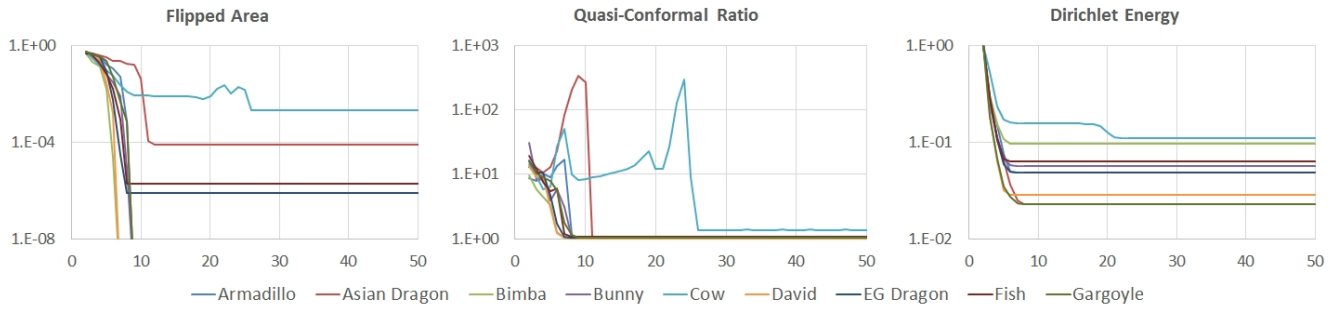

Figure 1: *Quality of the conformal mapping. The plots show the area of the folded-over triangles (left), the quasi-conformal factor (center), and the Dirichlet energy (right) as a function of the number of iterations.*