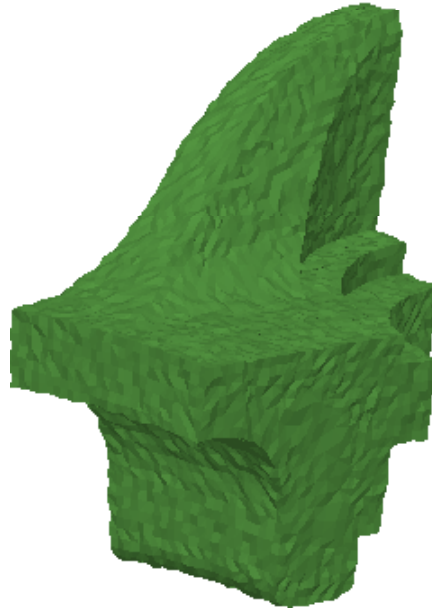


# A New Variational Model for Surface Fairing

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Clean surface



Noisy surface



Denoised surface

Surface fairing is an important problem in computer graphics. The goal is to remove noise, i.e. spurious oscillations, from a digitized surface while preserving its important features such as sharp edges and corners that are so common in man-made objects. Recently, successful variational image denoising models have been adapted to this task. We determined that the following regularization term is the analogue for surface denoising of Rudin, Osher, and Fatemi's total variation regularization:

$$\int_{\Sigma} |\kappa_G| d\sigma$$

Here,  $\kappa_G$  is the Gaussian curvature of the surface  $\Sigma$ , and  $d\sigma$  is the area element. The denoising result shown above was obtained via gradient descent for this regularization term.