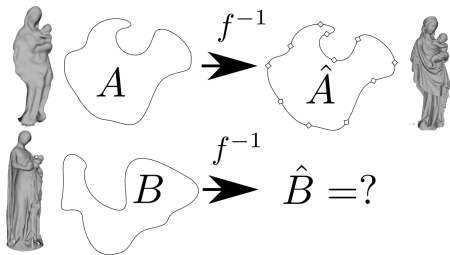# Surface descriptor

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April 5, 2016
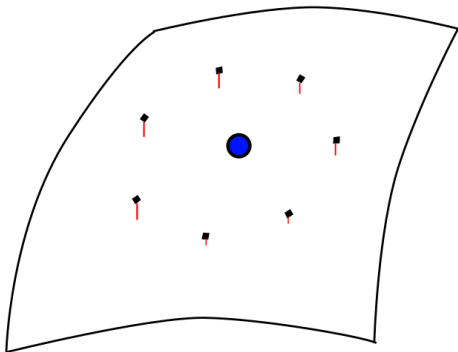
Ultimate objectives

3D example

Surface descriptor

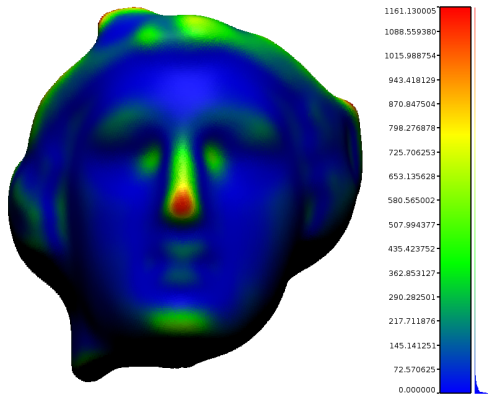# Fourier transform and geometry

- Example for 2nd order:

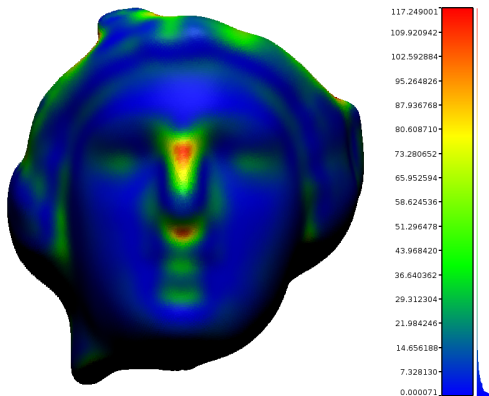$$s(\theta) = \frac{r}{2}(\kappa_1 \cos^2 \theta + \kappa_2 \sin^2 \theta) + O(r^3)$$

$$s(\theta) = \frac{r}{2} \left(\kappa_1 \frac{1 + \cos 2\theta}{2} + \kappa_2 \frac{1 - \cos 2\theta}{2} \right) + O(r^3)$$

- Frequencies 0 and 2 are linked to 2nd order derivative
- Frequencies 1 and 3 are linked to 3rd order derivative
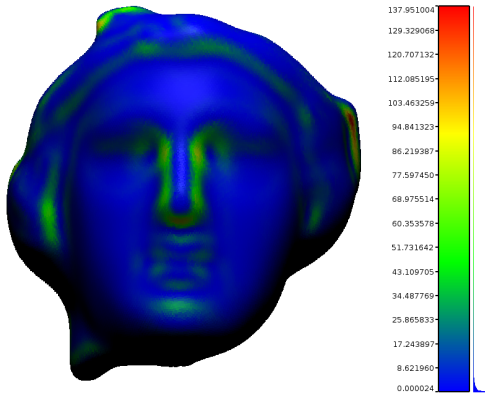- Higher frequencies need a geodesic disk to be stable

Fourier harmonic 0

Fourier harmonic 2

Fourier harmonic 1

Fourier harmonic 3