

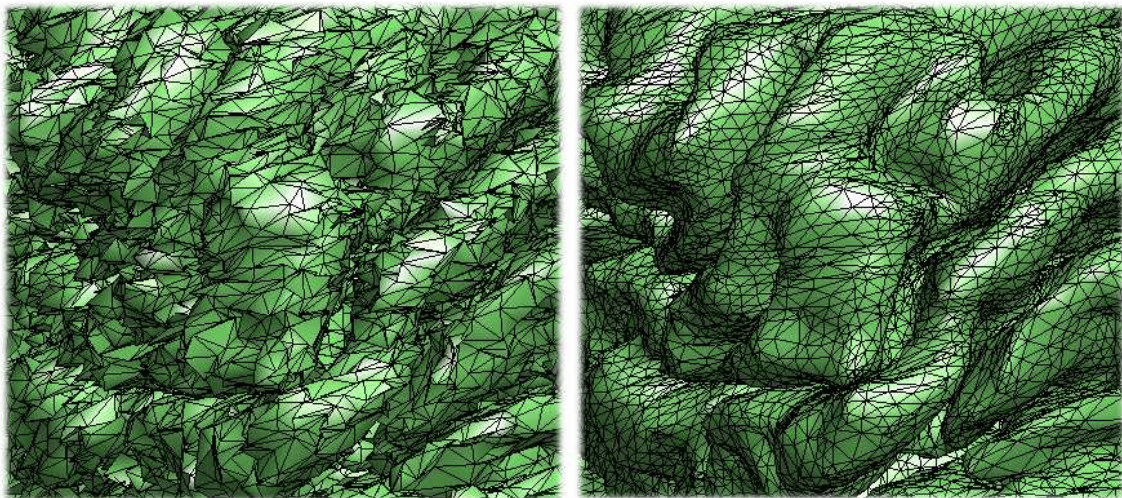


STAT 992 Statistical Methods in Signal and Image Analysis

Every MWF 11:00-11:50 in CS&S 1289

Course web page: www.stat.wisc.edu/~mchung/teaching/stat992/stat992.html

Instructor: Moo K. Chung, mchung@stat.wisc.edu



Brain surface mesh regularization and curvature estimation via kernel smoothing. One of class projects.

Course Requirement

The course requirement is minimal and should be accessible for any students who know basic mathematical statistics. All topics will be self-contained. For homework and projects, you can use any programming language such as R/Spplus, MATLAB, JAVA, C++ but the language of instruction will be in MATLAB due to its versatility of image manipulation.

Topics Covered

random fields, white noise, linear filtering, kernel smoothing, scale space, optimal filtering, Riemannian tensors, anisotropic smoothing, diffusion processes, diffusion equations, finite element methods, random walks, stochastic optimization, mixture models, Bayesian image segmentation, Gibbs sampler, Monte-Carlo methods in imaging, image registration, shape analysis, directional statistics, inference in image space, stochastic image simulation.

Evaluation

There are three possible options.

1. 20% class project + 30% independent project in your own research area + 50% biweekly homework.
2. 50% class project + 50% biweekly homework.
3. 30% class project + 70% biweekly homework.

Textbook

Edward R. Dougherty, Random Processes for Image and Signal Processing, IEEE Press 1999. ISBN: 0-8194-2513-3.