Porous Structure Modeling based on Anisotropic Gaussian Kernel Fitting

Mr. Weikai Chen

Abstract:

Porous structures are ubiquitous in nature and are used for many applications. Although 3D printing has made it possible to fabricate shapes with intricate interior structures, computational method for modeling and representing general porous structures is still lacking. In this talk, we present a method for modeling porous structures with complex geometry and arbitrary pore anisotropy specified by users or required by applications. We model the inner porous structure as the level surface of combined Gaussian kernels. Each pore is depicted by a transformed Gaussian kernel whose anisotropy is defined by the tensor field from user input or mechanical analysis. We first utilize anisotropic particle system to distribute the centers of Gaussian kernels with respect to the input tensor field. The porous structure is then generated from the particle system while following the anisotropy specified by the input. The resulting porous structure can be controlled by a set of parameters. Some preliminary results will be demonstrated in this report.

About the Speaker:

Weikai Chen is a full-time PhD student at the Department of Computer Science, the University of Hong Kong. His supervisor are Prof. Wenping Wang and Dr. Li-Yi Wei. His research interest are computer graphics and geometric modeling.

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