Seminar/Talk

Variational Surface Cutting

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Host: Chris Wojtan

In this talk, I will present a global variational approach to cutting curved surfaces so that they can be flattened into the plane with low metric distortion. Such cuts are a critical component in a variety of algorithms that seek to parameterize surfaces over flat domains, or fabricate structures from flat materials. Rather than evaluate the quality of a cut solely based on properties of the curve itself (e.g., its length or curvature), we formulate a flow that directly optimizes the distortion induced by cutting and flattening. Notably, we do not have to explicitly parameterize the surface in order to evaluate the cost of a cut, but can instead integrate a simple evolution equation defined on the cut curve itself. We arrive at this flow via a novel application of shape derivatives to the Yamabe equation from conformal geometry, and develop an Eulerian numerical integrator on triangulated surfaces. We also explore potential applications to computational design.

Monday, June 25, 2018 01:00pm - 02:30pm
Big Seminar room Ground floor / Office Bldg West (I21.EG.101)

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