

Elements:Software:Open-Source Robust Geometry Toolkit for Black-Box Finite Element Analysis PI: Daniele Panozzo, Co-PI: Denis Zorin

Fully Automated Simulation Pipeline

Initial geometric data (CAD, scans, volumetric)

Simulation-suitable geometry discretization Finite element

discretization

PDE discretization



Meshing

Solution

100% success rate on a 10k mesh dataset





Mesh-adaptive p-refinement for error control

$$k = \frac{\ln\left(B\hat{h}^{\hat{k}+1}\frac{\sigma_E^2}{\hat{\sigma}^2}\right) - \ln h_E}{\ln h_E}.$$



NSF CSSI PI Meeting, Seattle, WA, Feb. 13-14, 2020