A hybrid rugosity mesostructure (HRM) for faster rendering of fine haptic detail

Theoktisto, Victor; Fairen, Marta; Navazo, Isabel

We propose a faster method for surface haptic rendering using image-based Hybrid Rugosity Mesostructures (HRMs), paired maps with per-face height field displacements and normalmaps, which are layered on top of a much decimated mesh. The haptic probes force response algorithm is modulated using the blended HRM coat to render surface features at much lower costs. The proposed method solves typical problems at edge crossings, concave foldings and texture transitions. To prove the wellness of the approach, a usability testbed framework was built to measure and compare experimental results of haptic rendering approaches. Trial results of user testing evaluations show the goodness of the proposed HRM technique, rendering accurate 3D surface detail at high sampling rates, deriving useful modeling and perception thresholds for this technique.

http://dx.doi.org/10.1145/1643928.1643955