

# (Invited Talk) Quantifying Shape Using the Medial Axis

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## Abstract

The medial axis plays a fundamental role in shape matching and analysis, but is widely known to be unstable to even small boundary perturbations. Methods for pruning the medial axis are usually guided by some measure of significance, with considerable work done for both 2- and 3-dimensional shapes. Such significance measures can be used for identifying salient features, and hence are useful for simplification, comparison, and alignment. In this talk, we will present theoretical insights and properties of commonly used significance measures, focusing on those in 2D and 3D that are both shape-revealing and topology-preserving, as well as being robust to noise on the boundary. We'll also discuss more recent work in progress on using such measures to de-noise a shape and identify topologically and geometrically prominent features. Finally, we will cover several applications of these measures and techniques to real-world data sets.

## Biography

Dr. Erin Wolf Chambers is a Professor at Saint Louis University in the Department of Computer Science, with a secondary appointment in the Department of Mathematics. Her research focus is on computational topology and geometry, with a more general interest in combinatorics and combinatorial algorithms. Complementing this work, she is also active in research projects to support and improve the culture and climate in computer science and mathematics, as well as to try to improve broader STEM educational experiences at all levels. She serves on the Computational Geometry Steering Committee and the Women in Computational Topology Steering Committee, as well as being an editor for Journal of Computational Geometry and for the Journal of Applied and Computational Topology. She received her PhD in Computer Science from the University of Illinois at Urbana-Champaign in 2008, and was a Visiting Research Professor at Saarland University in summer 2011.