TECHNISCHE UNIVERSITÄT WIEN
Institut für Computergraphik und Algorithmen
Arbeitsbereich für Computergraphik

OESTERREICHISCHE COMPUTER GESELLSCHAFT
AUSTRIAN COMPUTER SOCIETY

laden gemeinsam zum

GASTVORTRAG

Bardia Sadri

Side Effects Software Inc.

“Flow complex based curve reconstruction from 3D curve skteches ”

Abstract:

3D sketching technology is developing rapidly. It is popular because it allows us to quickly create a substantial amount of visual information about an intended model by drawing space curves that trace out its important features. The effectiveness of these tools is largely due to the fact that describing these (1-dimensional) curves is generally much easier than describing the (2-dimensional) surface patches which fully describe the model. On the other hand, sketches are a fair distance away from becoming actual 3D models. They also tend to clutter rather quickly with the addition of each new curve and therefore lose their visual value. It is therefore highly desirable to be able to automatically turn a 3D sketch into a 3D model composed of surface patches. This leads us to an instance of the well-studied "shape reconstruction" problem in which the input is the 3D sketch. None of the known solution for shape reconstruction are expected to work well in this setting due to several obstacles such as the inherent sparsity of the input or the difficulty of making strong assumptions about the output such as its being smooth or even manifold.

In this work we propose practical algorithms that succeed in producing convincing results in many practical situations. Our algorithms are based on a geometric structure known as the "flow complex" and mathematical frameworks such as critical point theory of distance functions and persistent homology. We sketch out perceptually intuitive conditions for the input curve network which if satisfied, important aspects of the quality of the output of the algorithm can be guaranteed.

Biography:

Bardia Sadri received his undergraduate degree in Computer Engineering from Sharif University of Technology (Tehran, Iran) in 1999, and his PhD in Computer Science from the University of Illinois at Urbana-Champaign in 2006. He has held research positions at Duke University and University of Toronto. His research interests include computational geometry and topology and geometry processing with applications to computer graphics, computer aided design, and geographical information systems. Among his central research topics are surface and medial axis reconstruction, external memory algorithms on triangular meshes, and mesh repair and untangling. He is currently a 3D scientist with Side Effects Software Inc.

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Ort: TU Wien, Favoritenstr. 9, Stiege 1, 5. Stock, Seminarraum E186