

Isosurfaces and Level-Set Surface Models ^a

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Technical Report UUCS-02-010

^aVersions of these notes and the accompanying talk appeared in tutorials at IEEE Visualization 2000 and 2001, and ACM SIGGRAPH 2001 and 2002.

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April 3, 2002

Abstract

This paper is a set of notes that present the basic geometry of isosurfaces and the basic methods for using level sets to model deformable surfaces. It begins with a short introduction to isosurface geometry, including curvature. It continues with a short explanation of the level-set partial differential equations. It also presents some practical details for how to solve these equations using up-wind scheme and sparse calculation methods. This paper presents a series of examples of how level-set surface models are used to solve problems in graphics and vision. Finally, it presents some examples of implementations using *VIS-Pack*, an object oriented, C++ library for doing volume processing and level-set surface modeling.