University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

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BSc (University of Victoria, 2015)

"Polygonization of Implicit Model"

Department of Computer Science

Thursday, December 13, 2018
1:00 P.M.
Engineering and Computer Science Building
Room 467

Supervisory Committee:
Dr. Brian Wyvill, Department of Computer Science, University of Victoria (Supervisor)
Dr. Kwang Moo Yi, Department of Computer Science, UVic (Member)

External Examiner:
Dr. Colin Bradley, Department of Mechanical Engineering, UVic

Chair of Oral Examination:
Dr. Dennis Hore, Department of Chemistry, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

In computer graphics, implicit modelling is a way of representing models by using combinations of implicit functions. These are then polygonized to produce a mesh typically formed from either quads or triangles. We present a comparison of two fundamental algorithms in polygonization in order to produce an algorithm that is better than the current industry standard: Marching Cubes. By using planar cross-sections we are able to bypass several problems from Marching Cubes, as well as produce a mesh of higher resolution and quality. The algorithm is limited to surfaces of genus 0, but it still outperforms Marching Cubes both in runtime as well as overall mesh quality.