

# Exact Geodesic Algorithm Implementation

Projet INF555

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# Introduction

An exact algorithm for computing geodesics on triangular meshes

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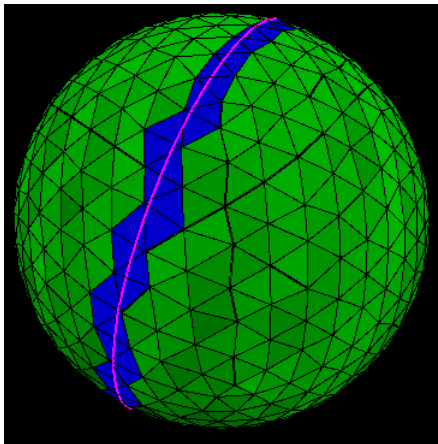
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## Why computing geodesics?

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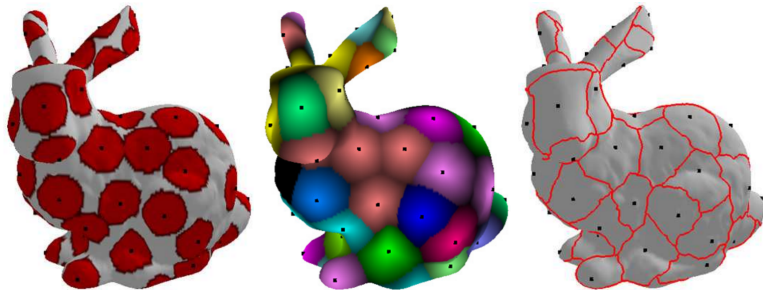
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*Geodesic Remeshing Using Front Propagation*, Gabriel Peyre (CMAP).

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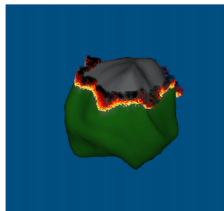
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*Meshes on Fire*; Haeyoung Lee, Laehyun Kim, Mark Meyer, Mathieu Desbrun (Caltech).

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# Distance field propagation

A light source that illuminates through windows

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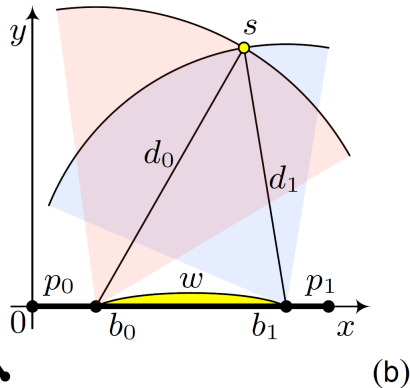
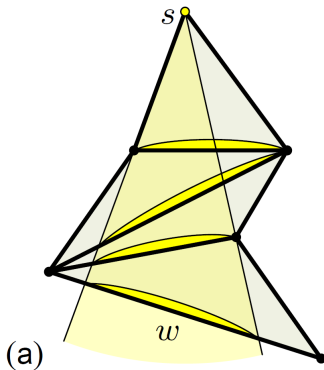
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$$w = (b_0, b_1, d_0, d_1, \sigma, \tau)$$

# Distance field propagation

## The saddle point issue

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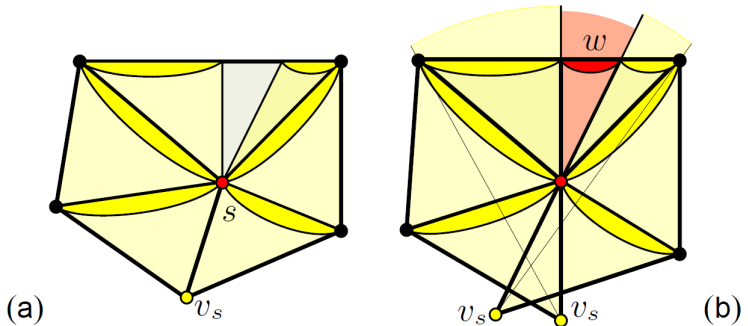
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# Distance field propagation

## The propagation method

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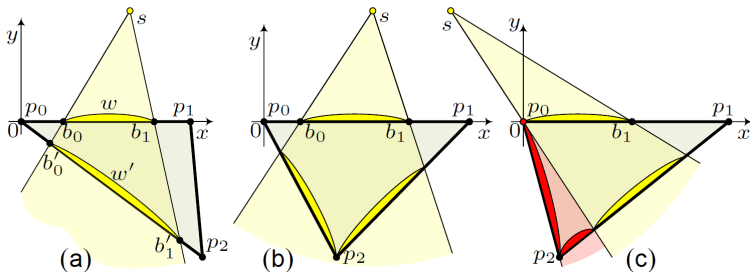
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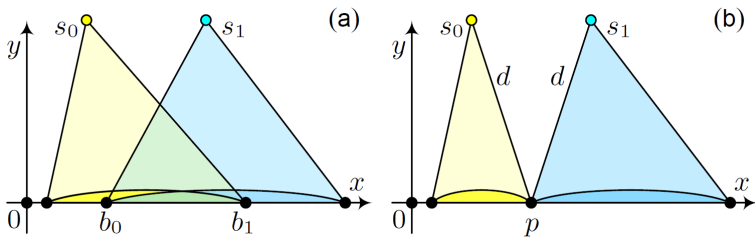
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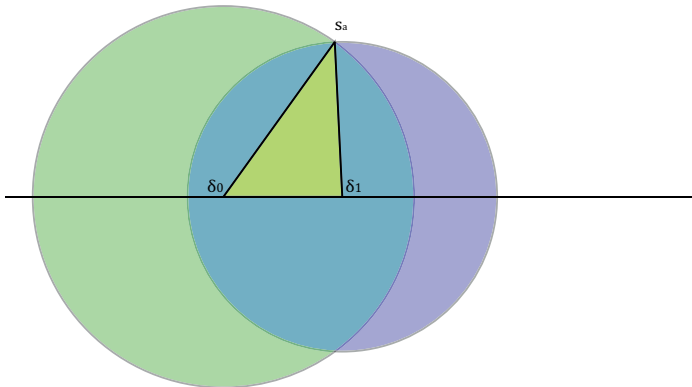
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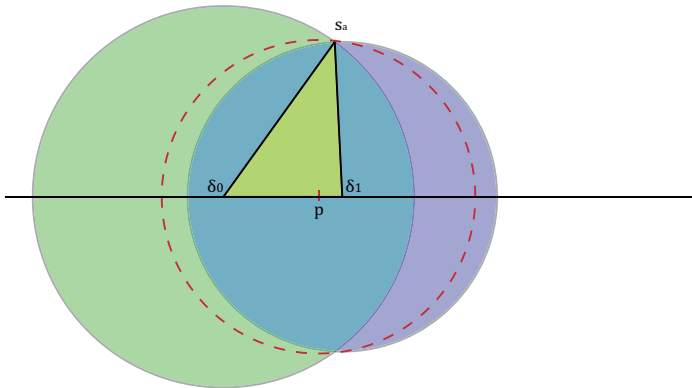
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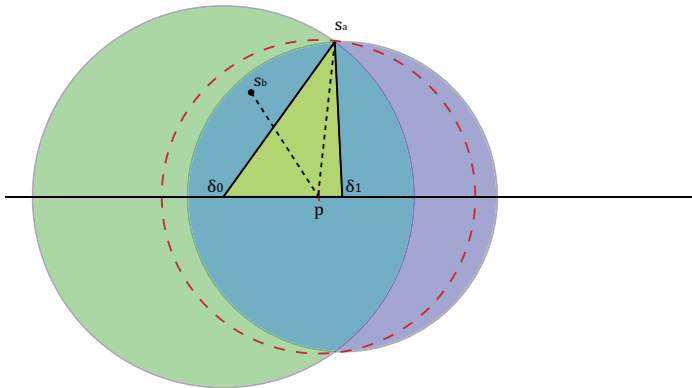
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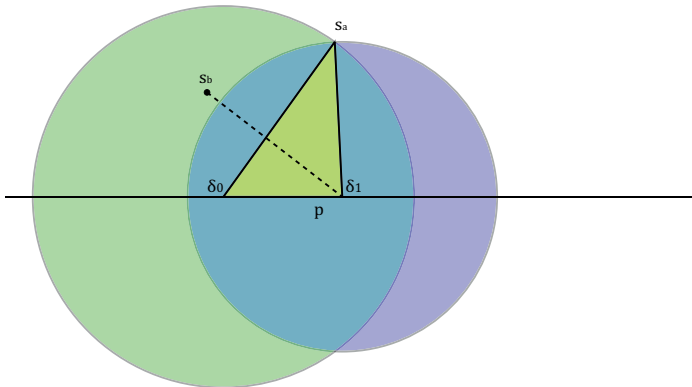
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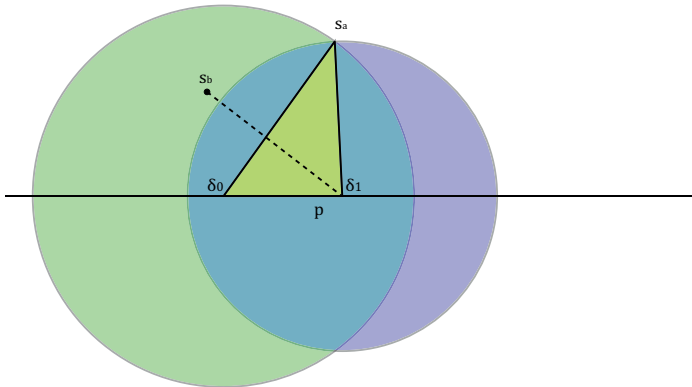
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$$d_0^a < d_0^b \text{ and } d_1^a < d_1^b \iff a \text{ is better on the full interval}$$

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# Backtracking

A path that goes back to the source thanks to windows

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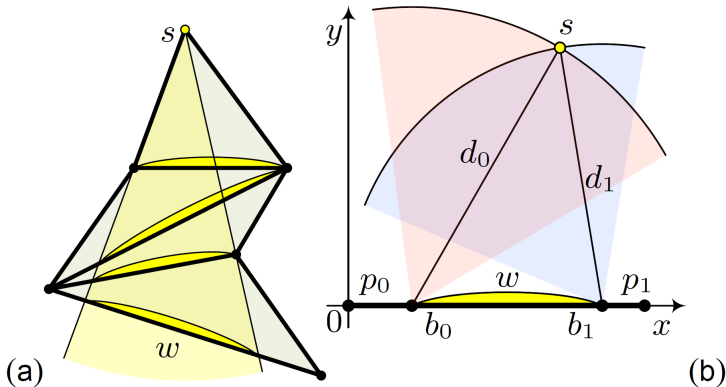
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# Backtracking

## Starting from a vertex

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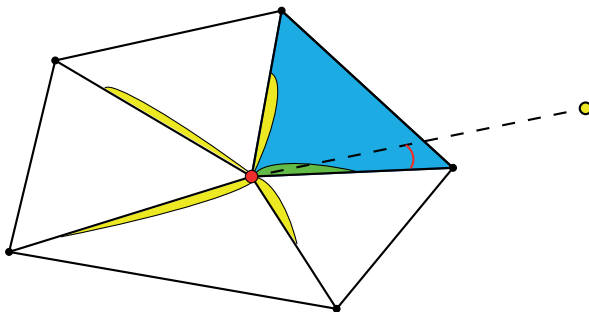
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# Class structure

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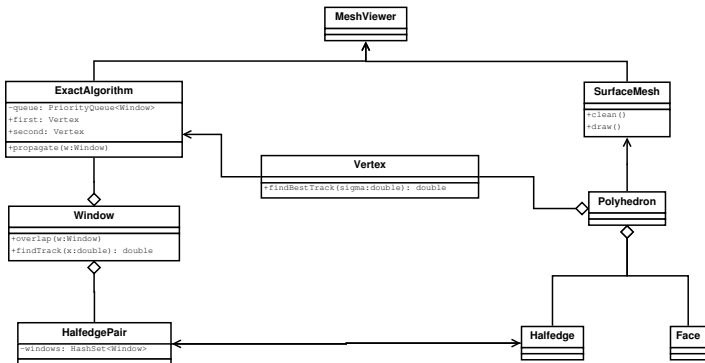
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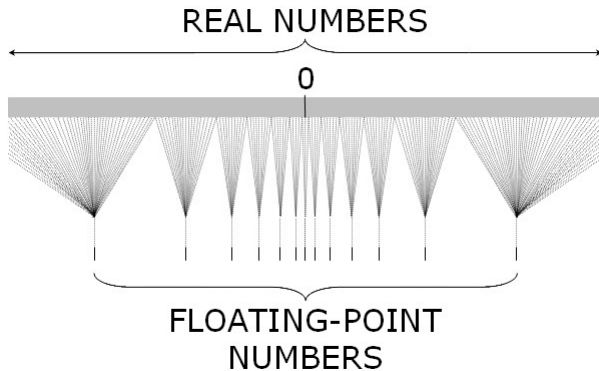
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