

Flutoo – generation of a TIN for river hydraulics from 1-D-data



Flutoo

Automatic generation of a 2-D-TIN for river hydraulics from 1-D cross section data

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Flutoo

Partner:

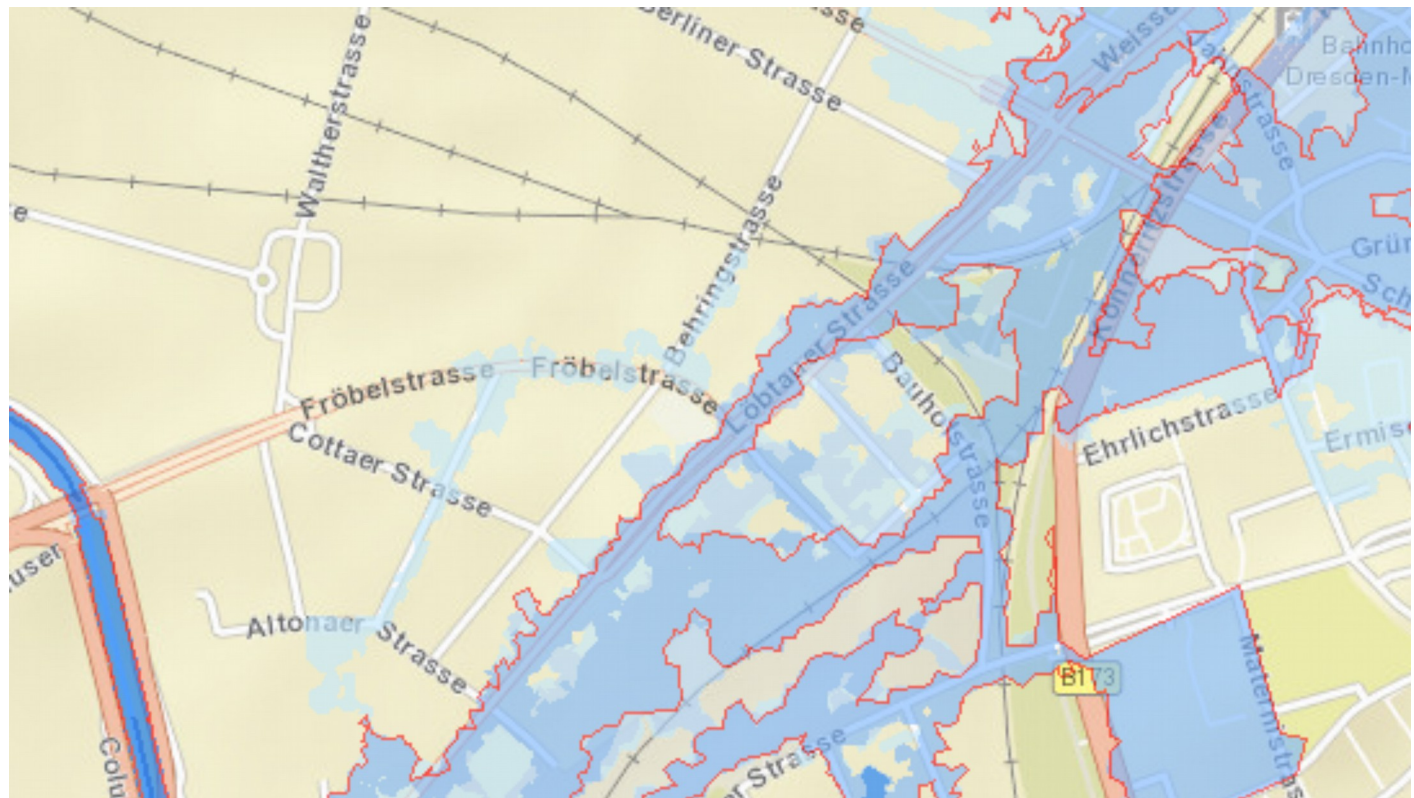
HKV hydrokontor, Aachen, Germany



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Introduction

Flutoo is a tool for data preparation in 2-D-flood simulations in rivers



ZÜRS public: www.kompass-naturgefahren.de

Flutoo – generation of a TIN for river hydraulics from 1-D-data objective

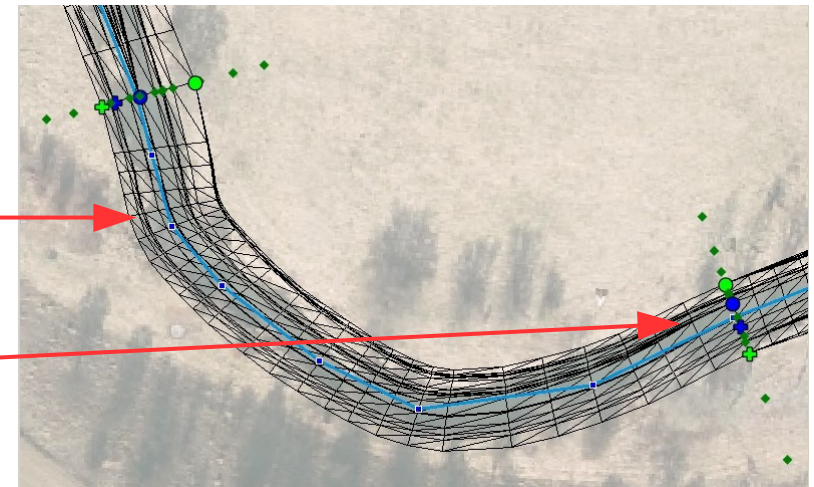
What we have:

- Cross sections
- Stream center line



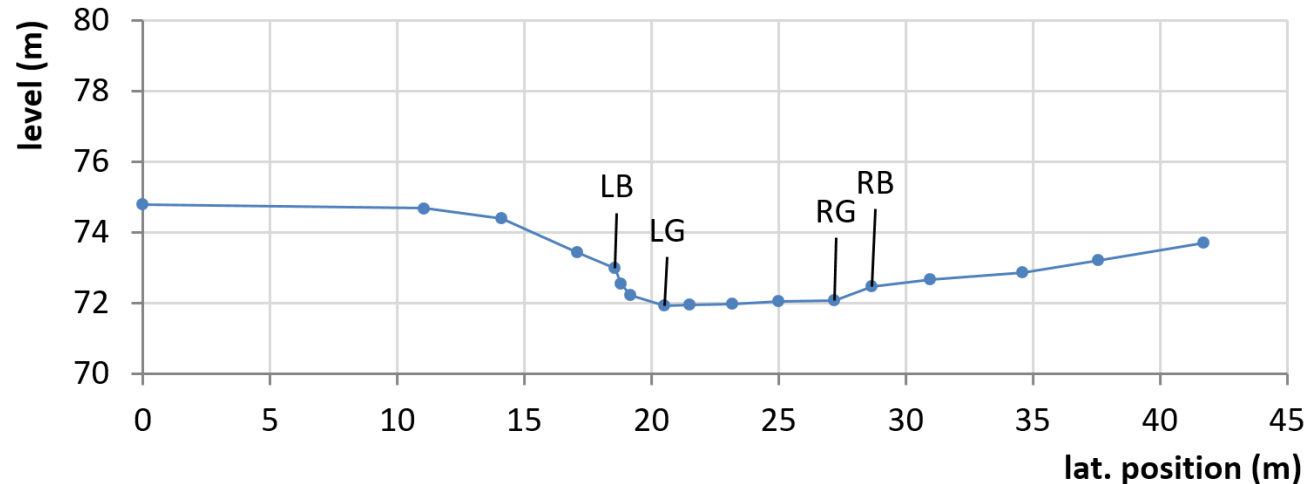
What we need:

- TIN
- Left/right bank,
left/right bottom edge



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Estimating edges of the bottom and the bank

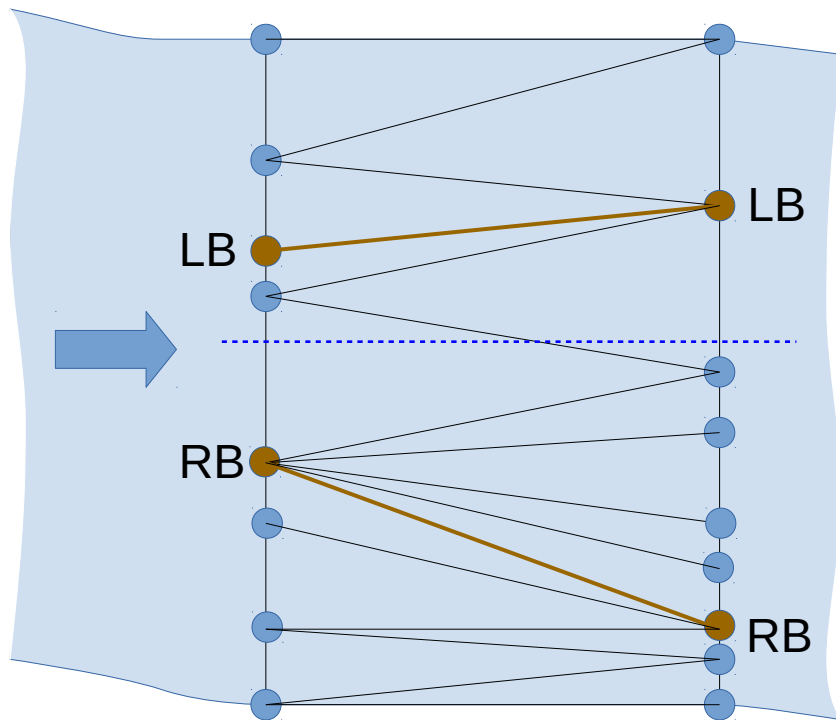


- First try: Walk along the points on the profile and find points, where the slope to the previous and to the next point differ significantly
 - ➔ slow, bad yield ratio (<90%)
- Second try: A dedicated weighting function included in an SQL query.
 - ➔ very fast, high efficiency (>98%)

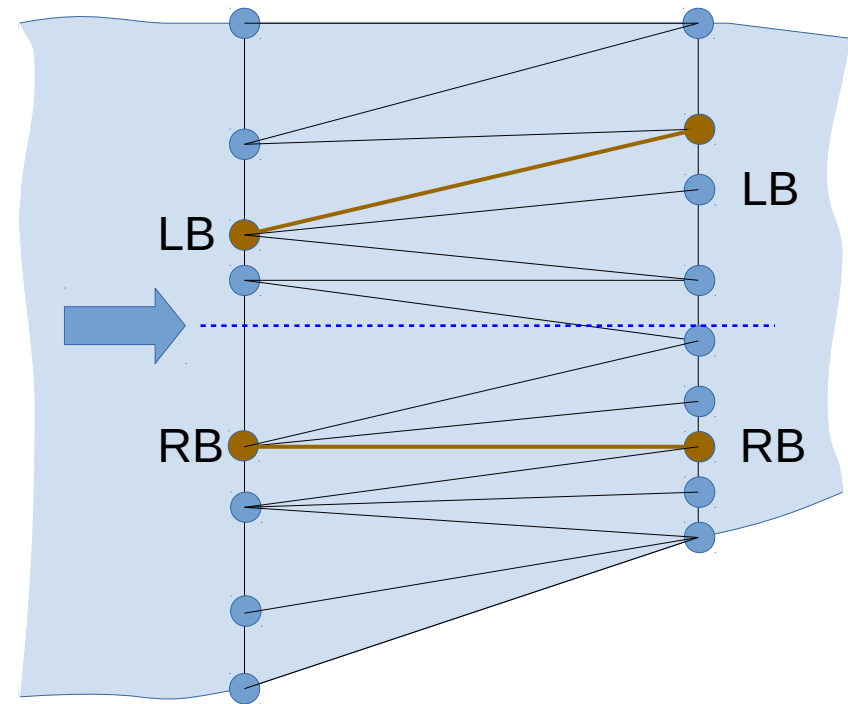
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Edge lines have to be interpolated between two profiles along the stream center line

Case 1: Profiles of similar length



Case 2: Profiles of similar length

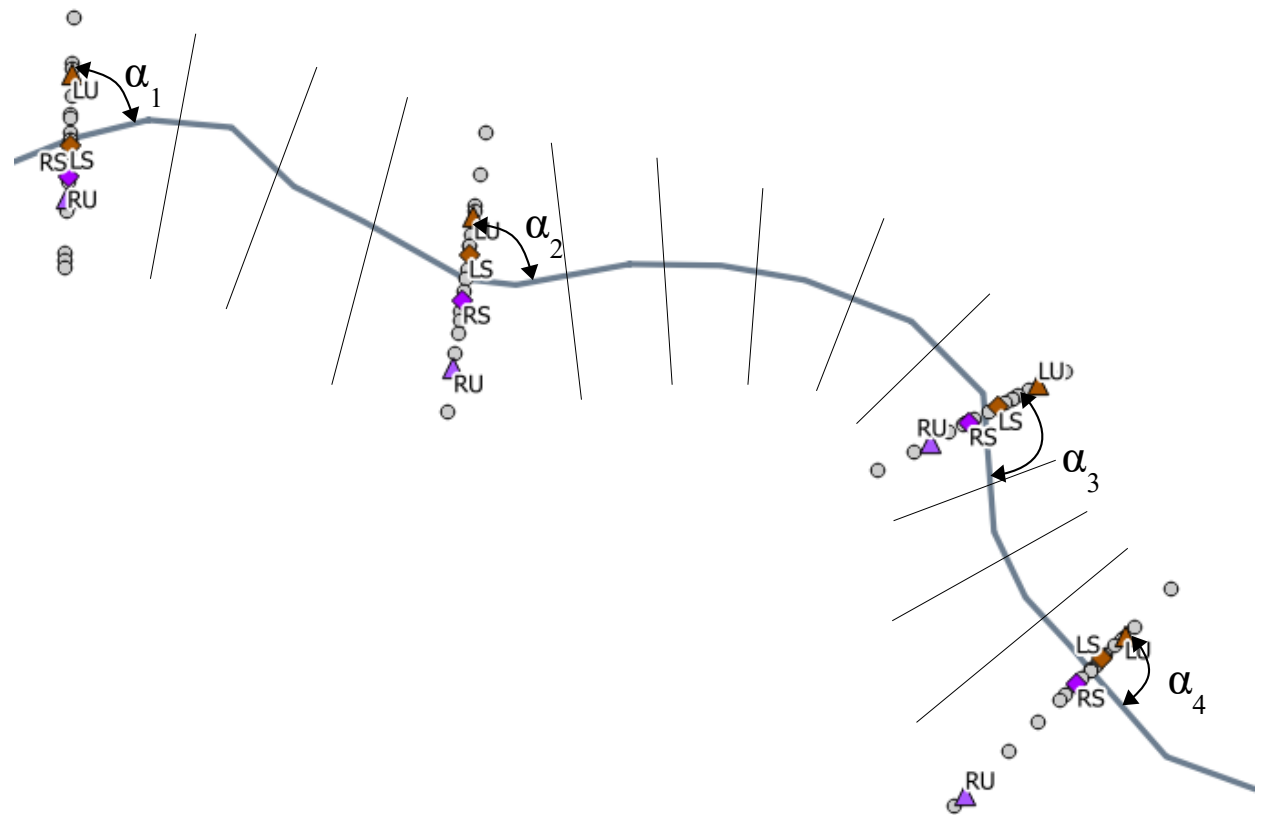


stream
center line

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Intermediate profiles have to be interpolated along the stream center line:

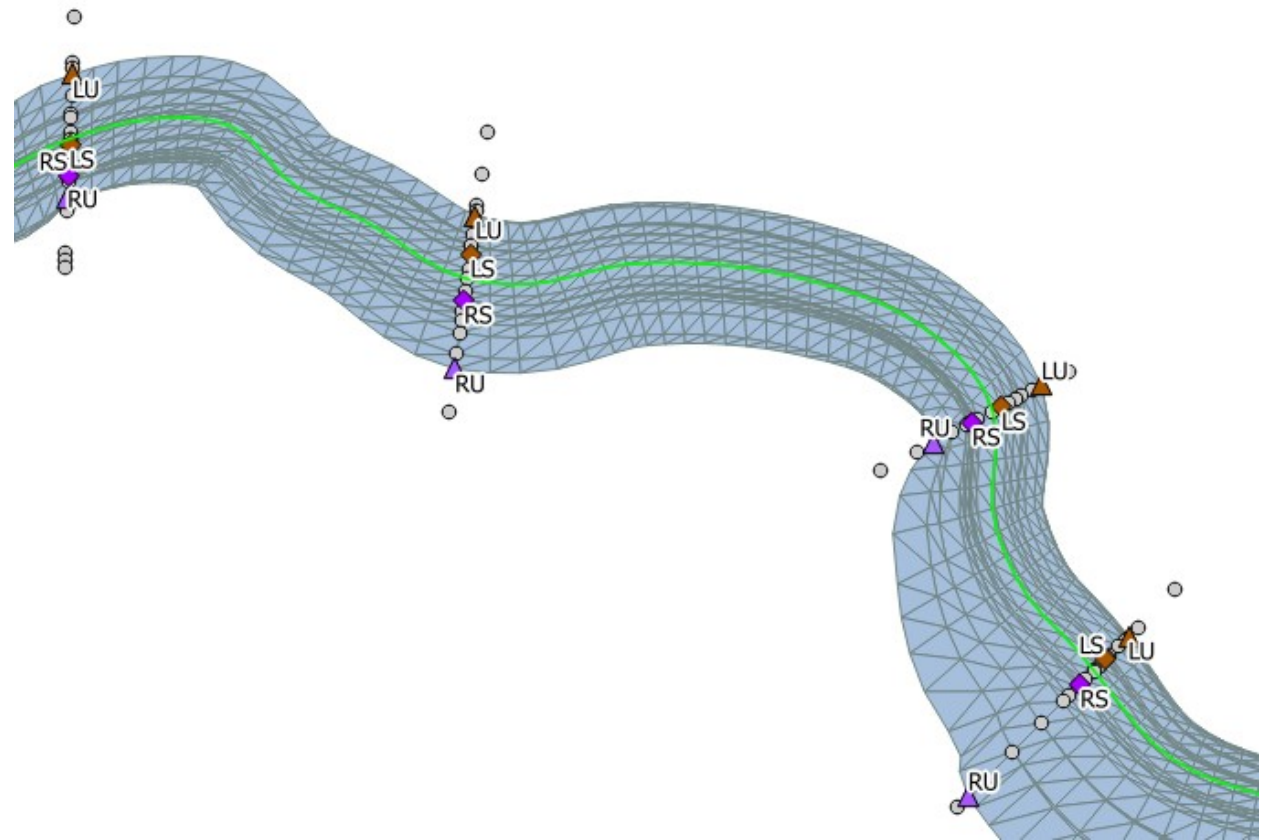
- Left length
- Right length
- Angle to the stream center line



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Intermediate profiles have to be interpolated
along the stream center line:

- Left length
- Right length
- Angle to the stream center line



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visualisation



Drawbacks

- Sometimes lathy triangles
- Overlapping triangles in narrow curves

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Design characteristics

Design

- Integration into QGIS toolbox
- geo-functionality of PostGIS

Based on: QGIS



Python



PostGIS



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visualisation



Visualisation with Blender

- Data export via wavefront file (ASCII)
- Define Material and light source
- Python code for camera path along the stream center line

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Thank you!