Advanced Lidar processing Using the RVT and LiVT Toolboxes (beta) – a quick guide

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Aims

The aim of this lab is familiarise yourself with two bespoke toolkits that have been developed to help create specialist lidar visualisations for archaeological interpretation.

The two toolkits that we will look at are the Relief Visualisation Toolkit, developed by Klemen Zakšek and Krištof Oštir, and the Lidar Visualisation Toolkit (LiVT), developed by Dr Ralf Hesse and provided free by Archaeolandscapes Europe.

The toolkits are in beta and so are to be used with caution but provides a powerful interfaces for creating a number of lidar visualisations. They do not fully integrate with QGIS (unlike the plugins) but create images that can be easily imported to your map view.

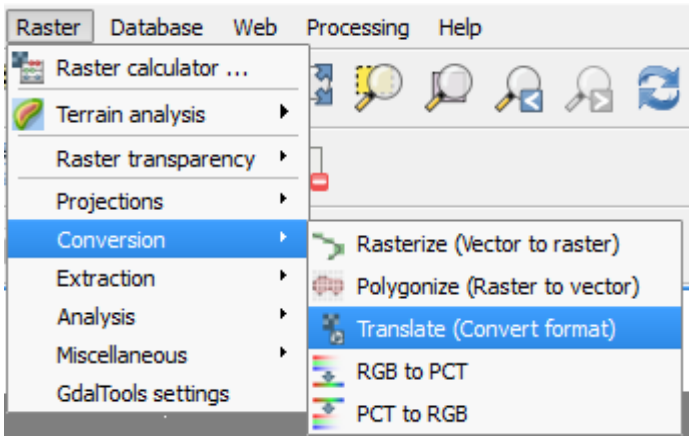
In this guide we will cover

- exporting your data to the correct formats (.tif for use in RVT / .bil format for use in LiVT (using lastools)
- Using RVT for creating a range of visualisations
- Processing in LiVT
- Bringing your RVT / LiVT created models in to QGIS

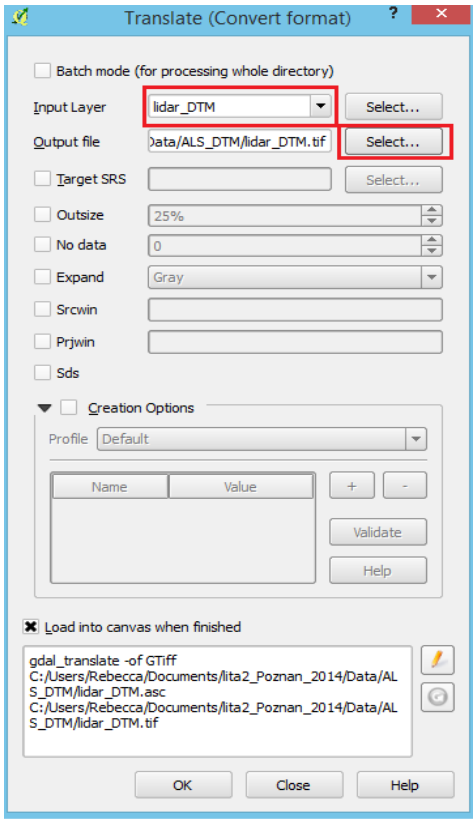
Using RVT

Task 1 – Exporting your data to .tif

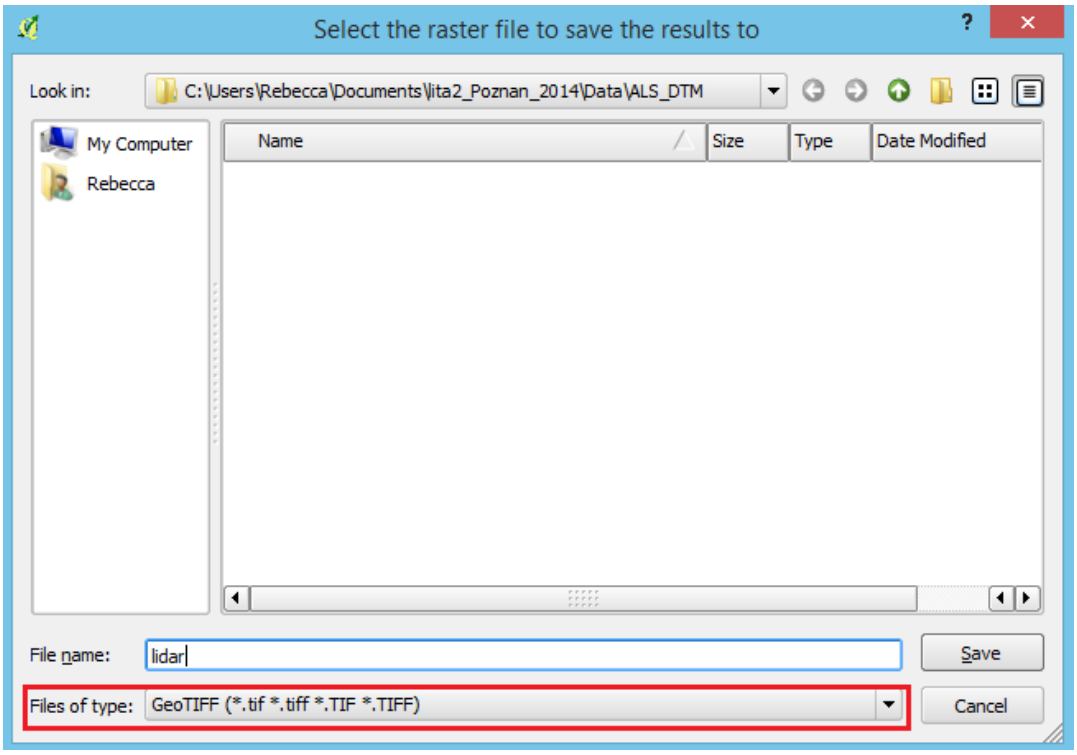
1. In QGIS open your lidar DTM lidar.asc
2. Go to Raster > Conversion > Translate (Convert Format)



3. In “Input layer” pick your lidar DTM tile. Beside “output layer” click “Select”



4. Name your raster and select Geotiff for the output format. Click Save

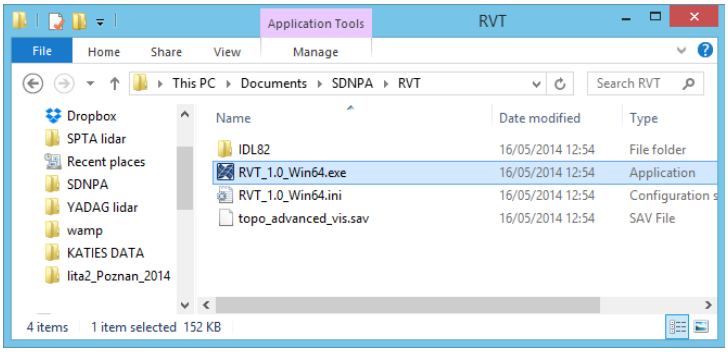


5. The tool will automatically load the converted file into QGIS (and will ask for the CRS). Once loaded, the tool will produce a pop-up to tell you that the processing is done.

Task 2 – Using RVT

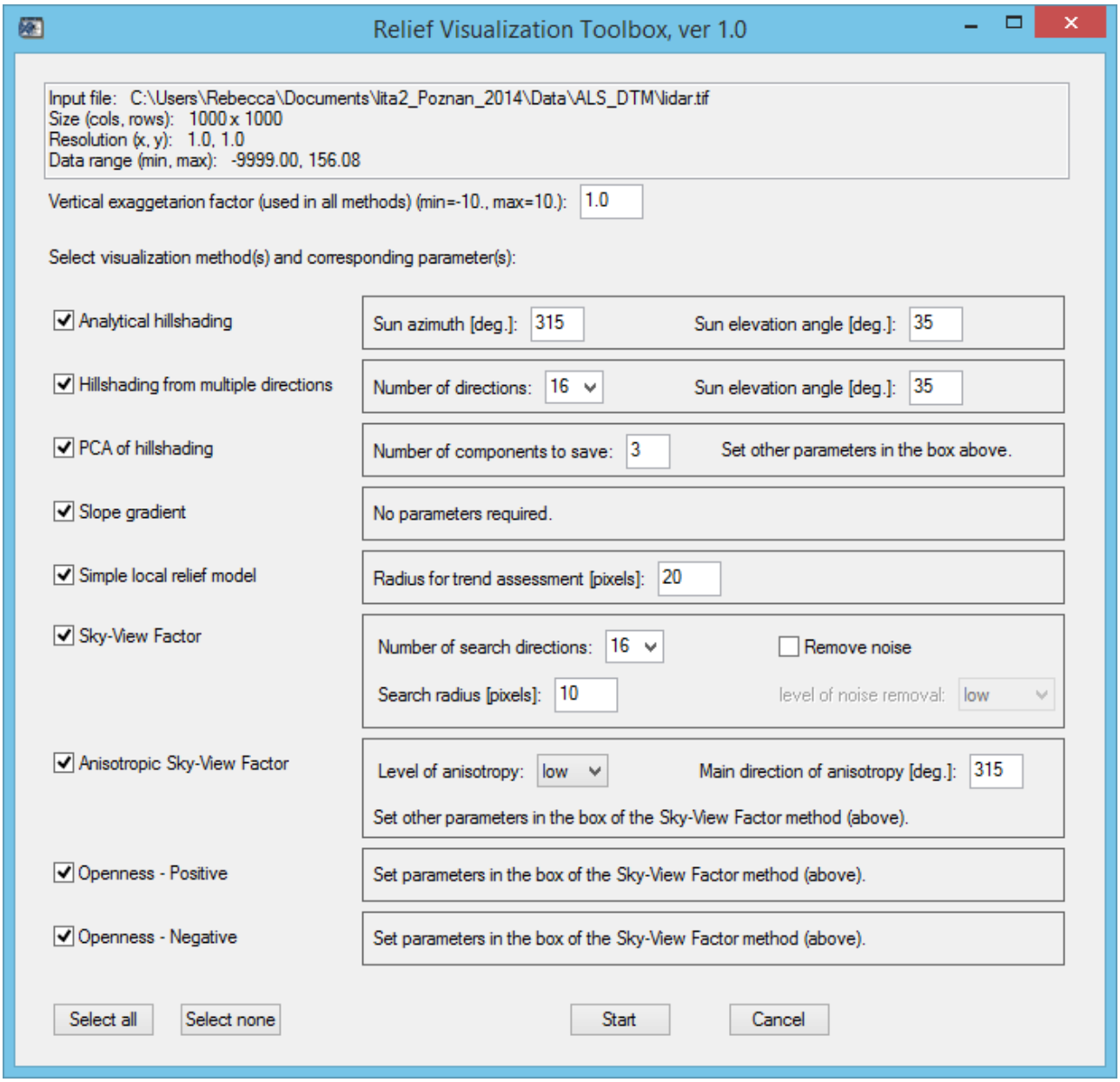
1. Download RVT from

2. Open RVT, by navigating to the folder where you saved it and double clicking the RVT_1.0_Win64.exe file. When the IDL pop-up opens click to continue running the programme.

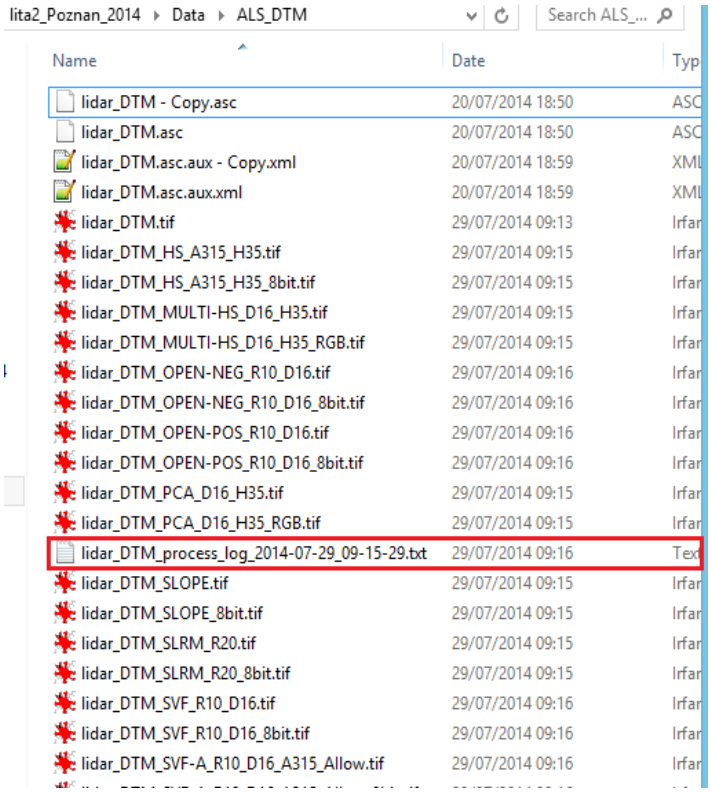


3. You will be asked for your DTM in geotiff format. Navigate to the file you just converted using QGIS.

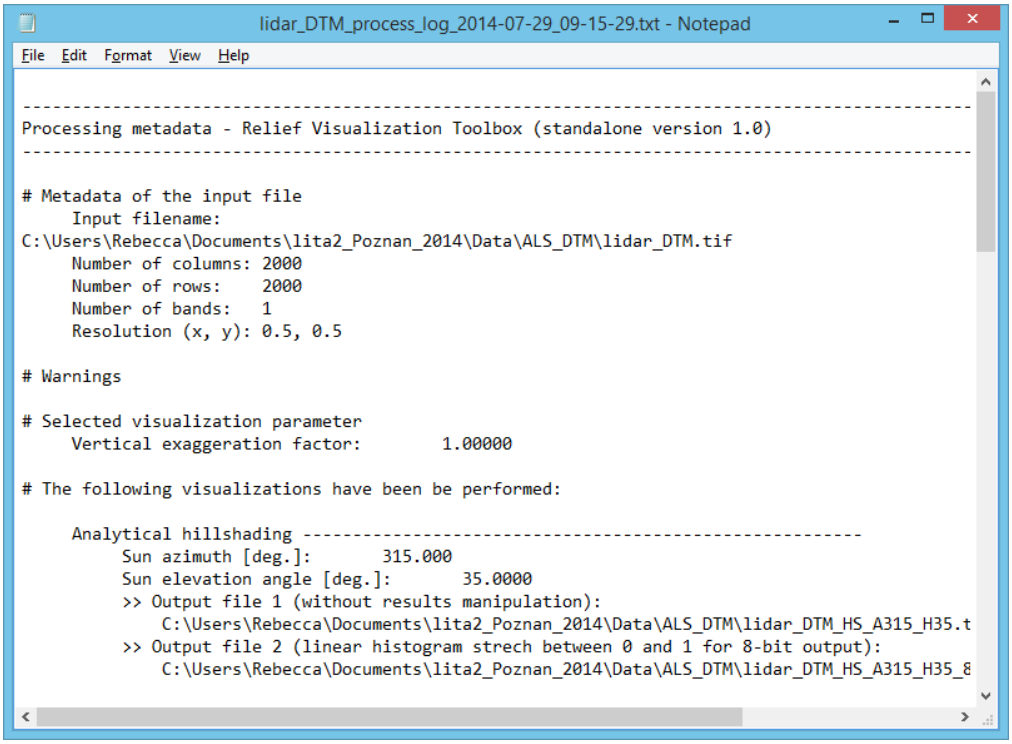
4. The RVT interface will now open, with all the visualisation options. Select the options you require (remembering to tailor the parameters if required). When you are happy with your selection and parameters click “Start”



5. Alter the tool parameters for each visualisation and click go. On older computers (with smaller RAM) you may need to select only one visualisation at a time. The new visualisations will be created in the same folder as your input DTM.tif. Navigate to this folder (in windows explorer) and you will see the new files and the processing log.txt which records all the parameters used to process the data.



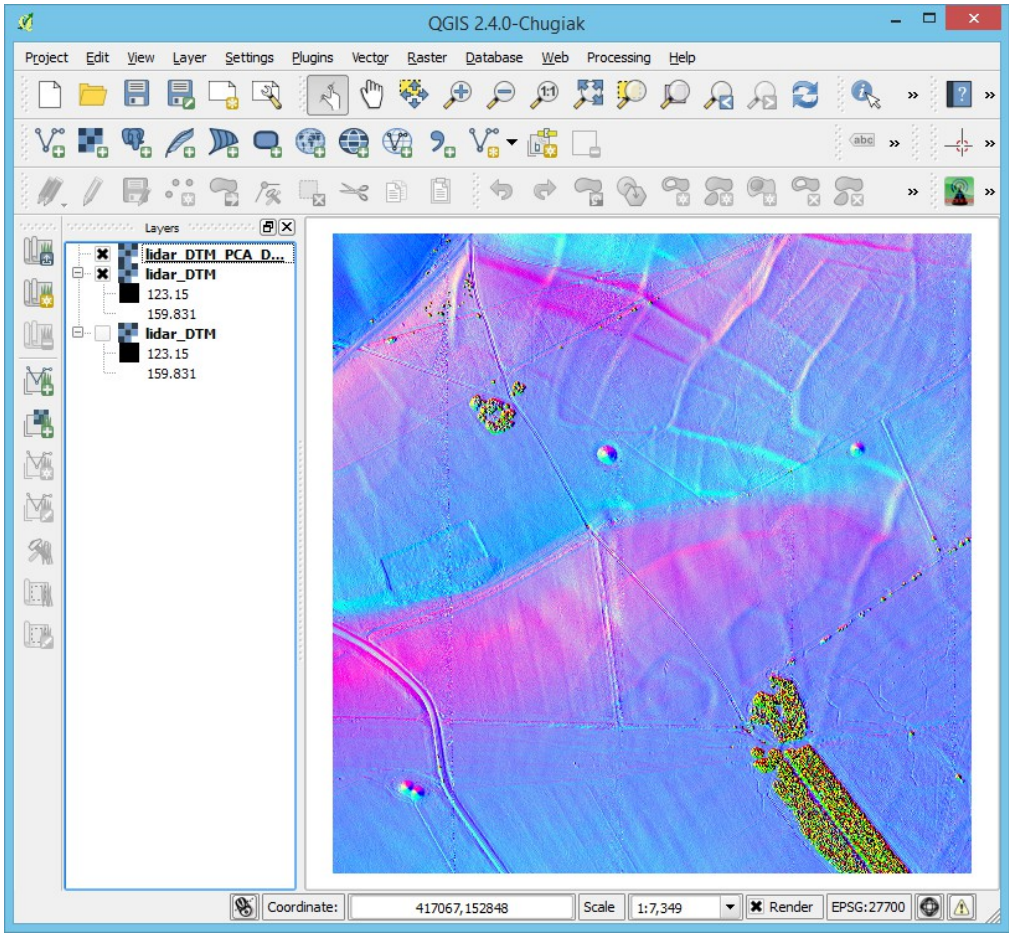
6. Open this file to see the parameters used.



Task 3 – Viewing the model

1. All the models created using RVT can be opened in QGIS

2. Open QGIS. Add the model (Add raster) 



What do you notice about the Simple Local Relief model?

Using LiVT

In order to create a Local Relief Model (as published in Hesse 2010) we will also need to use the LiVT.

Task 1 – Exporting your data to .bil

Currently LiVT beta can only handle data in a limited range of formats, of which the best to use is .bil. We can export to .bil from LAStools. (You can export a .bil from QGIS but this format is imperfect and will be rejected by LiVT – RBennett 29/7/14)

1. Use lasgrid to convert your lidar.asc into a bil. Make sure you select the correct step size ()

   Using the command line: lasgrid -i "filepath/to/lidar.asc" -step 0.5 -elevation - lowest -obil

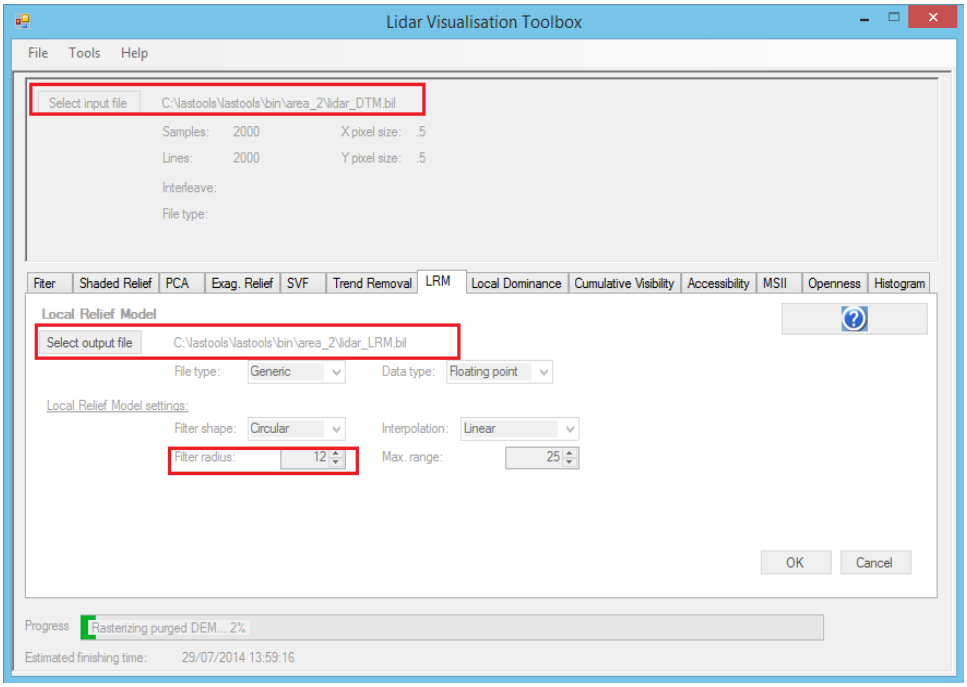
   Using the lasgrid GUI: Navigate to your lidar.asc >Pick the correct stepsize for the resolution of your DTM > Run the tool

2. LAStools will create three files (.bil, .blw and .bil.hdr) in the same location as your DTM .asc

Task 2 – Using LiVT

1. Open LiVT. The basic interface for LiVT contains a range of visualisations in tabs along. Each visualisation has parameters to define the process. We will make the Local Relief Model as an example so open the LRM tab

2. In the top part of the window import the DTM .bil file you exported from LAStools. In the LRM tab, select an output location and filename and adjust the parameters. Click OK. BE PATIENT! – the LRM involves a number of processing steps and can take some time to compute.



Task 3 – Viewing the model

1. Open QGIS. Add the LRM.bil (Add raster)

2. Edit the raster properties to improve the view of the model.