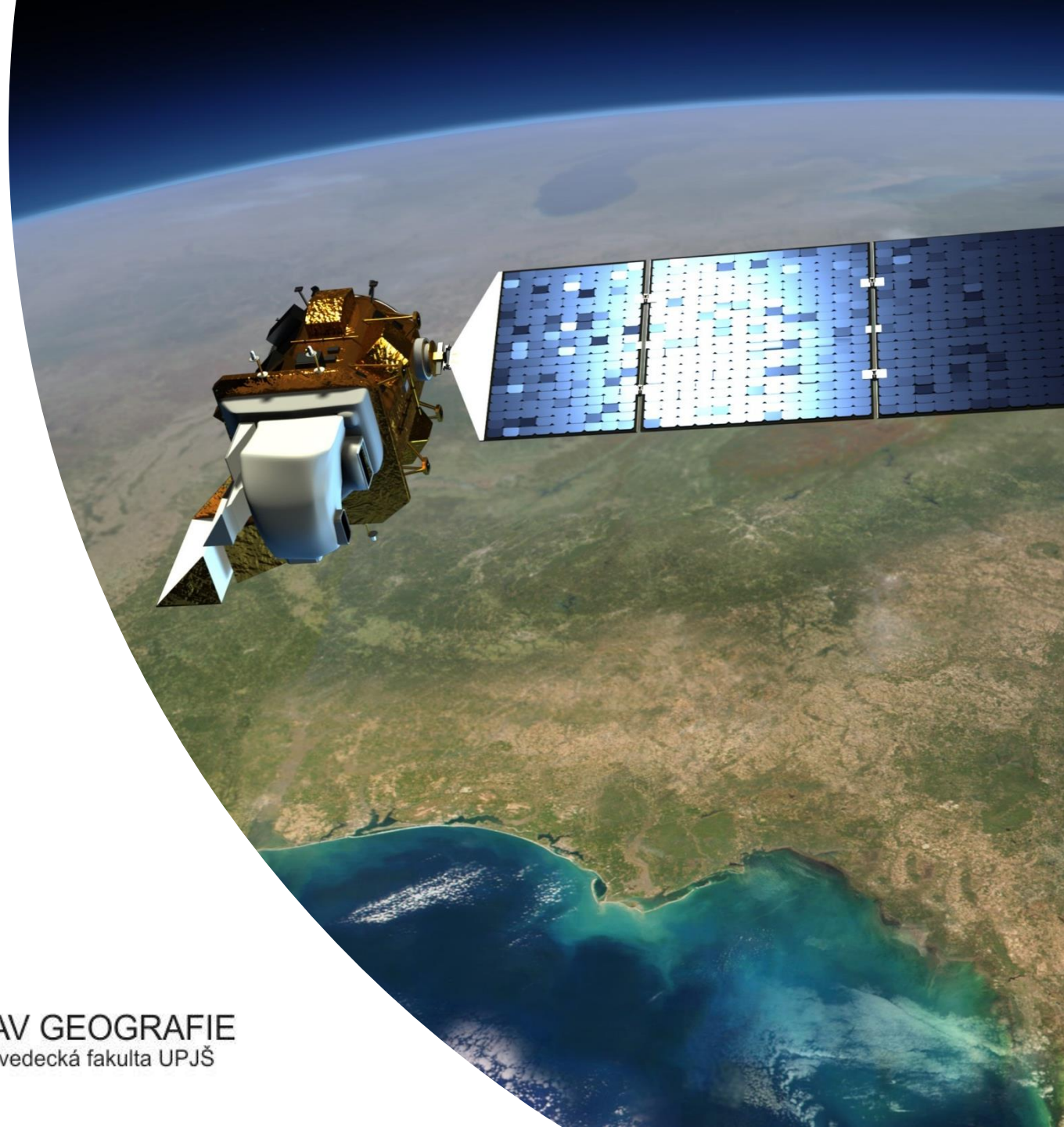
Diaľkový prieskum Zeme
- practicals



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1

Aktívne systémy DPZ – LiDAR – LAStools - zobrazenie a editácia

https://rapidlasso.com/lastools/
https://rapidlasso.com/blog/

LAS - standardized format ASPRS (American Society for Photogrammetry and Remote Sensing)

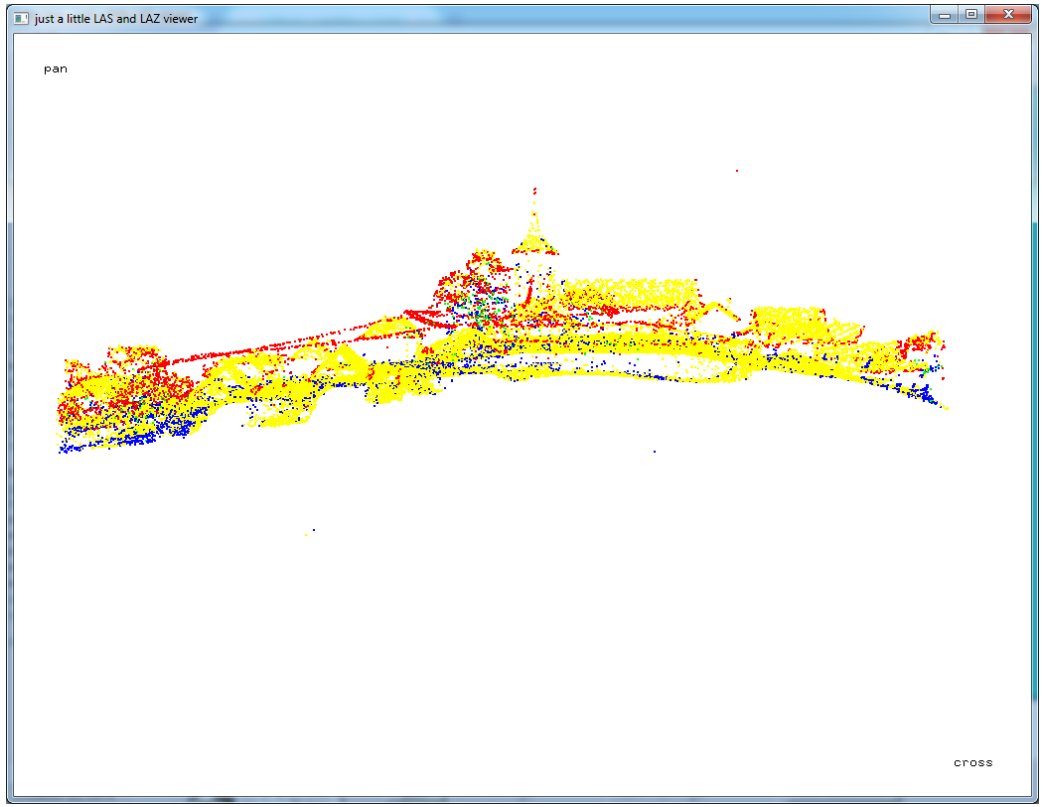
LAZ – zipped/compressed LAS
The option is also to import data in .txt format, but it is uneffective (slow processing)

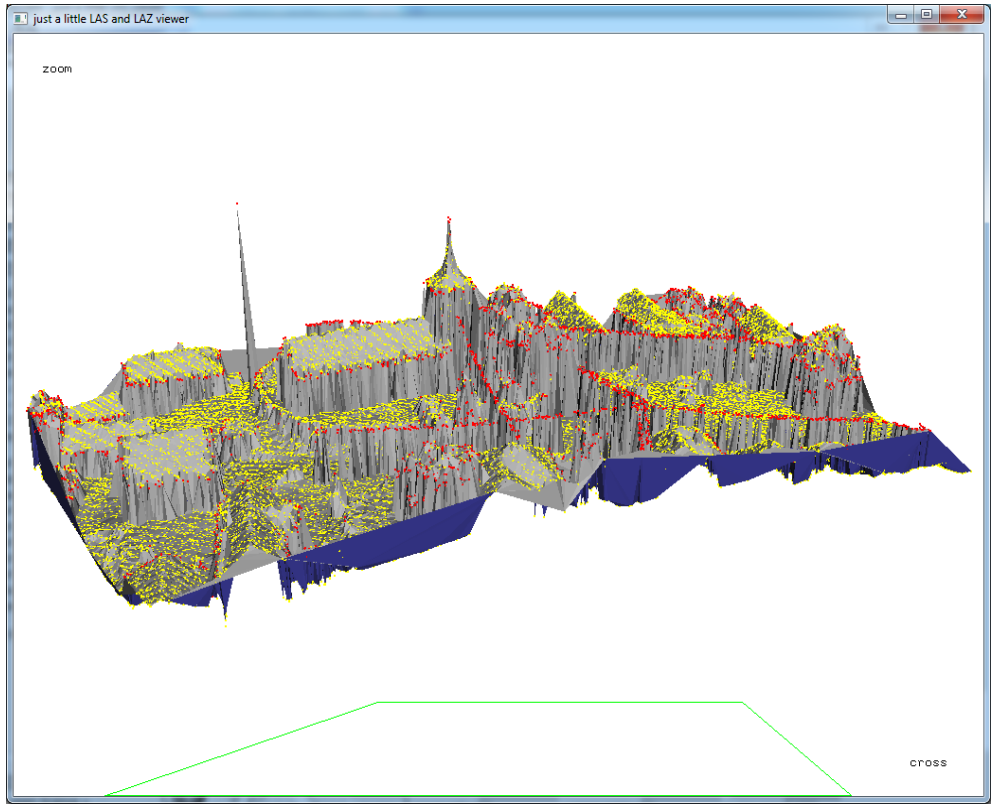
- lasview, lasground, las2dem

1. Úloha: Konverzia las/laz

- .laz
- .txt
- .zip

c - zafarbenie (červené - prvý odraz, zelené - preniká cez stromy, modré – last return
f - náhľad na prvý odraz
l - last return, dá sa z neho urobiť model krajinnej obálky
t - triangulate (+T – len povrch), (shift+ T – untriangulate)
g- len ground
- zmenším body, = zväčším body
- droplines, z-scale more





Editing mode

Lasclassify

- <X> to view the selected area (+page up, page down to change the area of the interest)
- Ctrl, shift (zoom in/out, translate up/down)
- <i> to show parameters of selected point
- <e> to turn on/off the “EDIT” mode

  - right-click to select e.g. “reclassify points as building (6)” via the pop-up menu

- <r> to register the edit once you are happy with your polygon

https://rapidlasso.com/2014/03/02/tutorial-manual-lidar-editing/

2

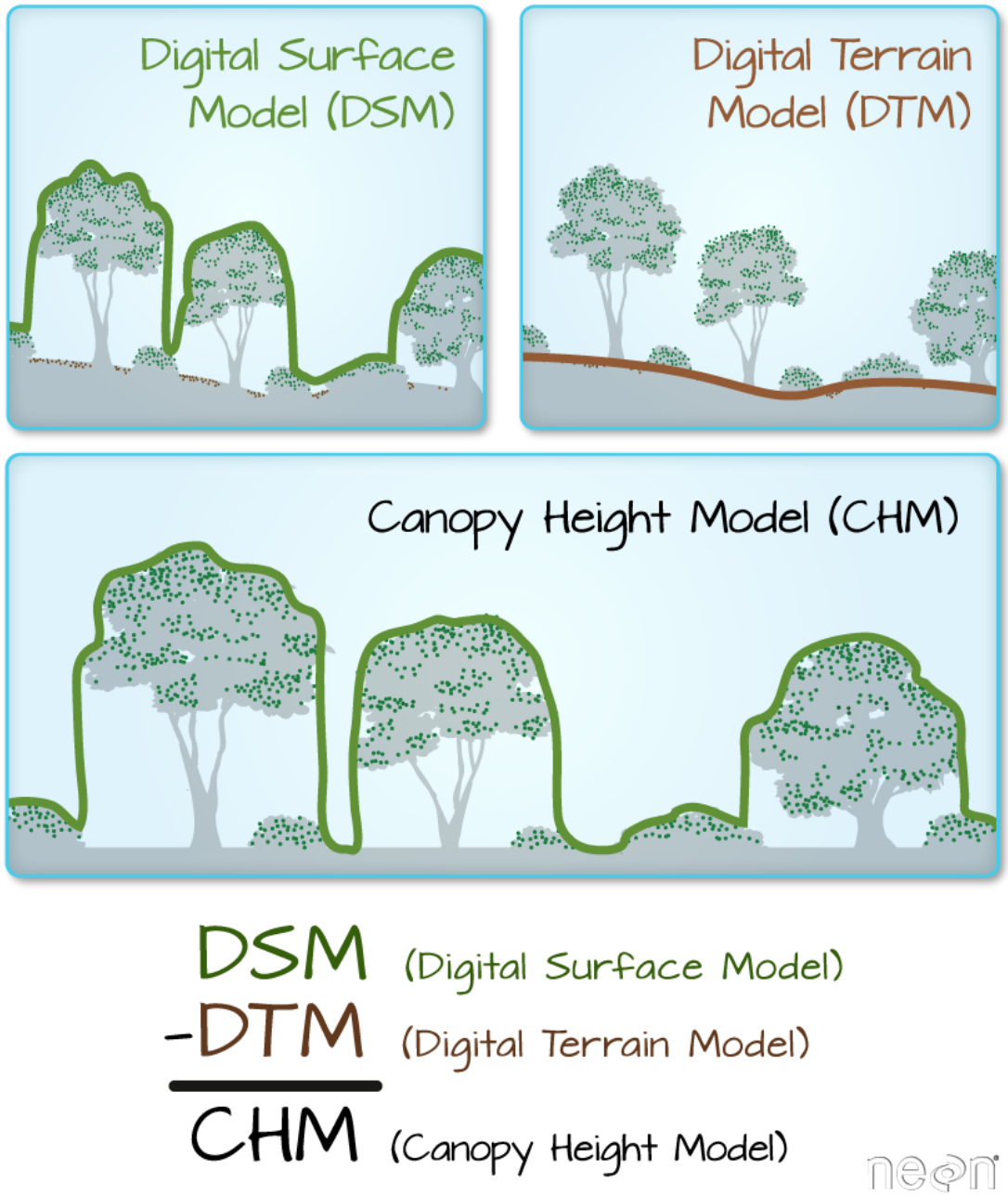
Aktívne systémy DPZ – LiDAR – LAStools digitálne modely DTM, DSM, CHM

1.) Vytvorte DTM a DSM model

2.) Vypočítajte hustotu bodov (point density) využijúc lasinfo:
- output options: select *_info.txt
- command line: type in “cd“

3.) Vytvorte CHM model:
https://rapidlasso.com/2014/11/04/rasterizing-perfect-canopy-height-models-from-lidar

- Export výstupov ako .png and .bil
- Otvorenie výstupov v QGIS/ArcGIS
- Výstupy aj s návodom a príkazmi, ktoré ste pre ich vytvorenie využili, uložte do .doc/.ppt

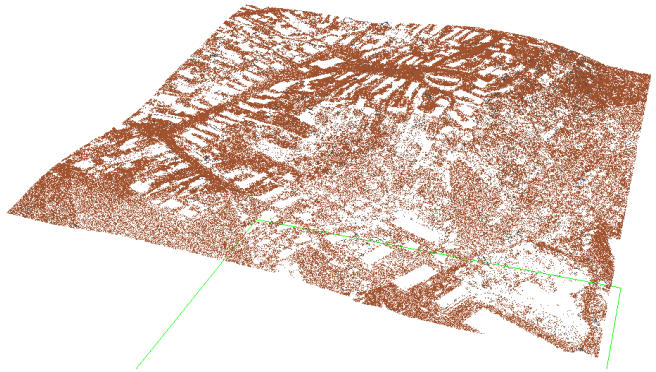


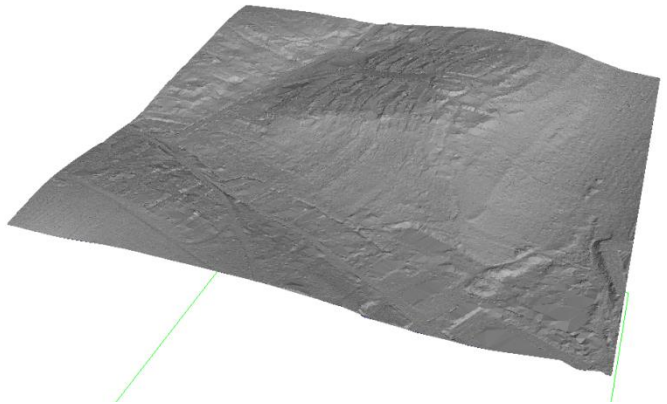
Digital Models

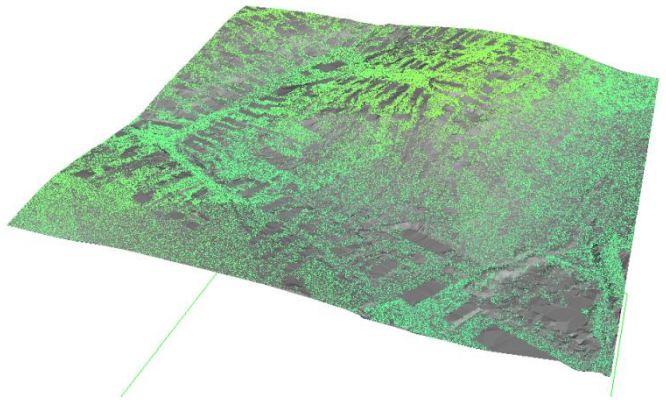
Digital Terrain Model (or DTM): ground elevation or the elevation of the Earth's surface (sometimes also called a DEM or digital elevation model)

Digital Surface Model (or DSM): top of the surface (imagine draping a sheet over the canopy of a forest

Canopy Height Model (or CHM): The height of objects above the ground







DTM (Digital Terrain Model)

Lasground:

- Find your .las file
- Filter by classification or return (2 = ground)
- Type of the area (town or flats)
- Save the output as .las
- View – color by ..., triangulate

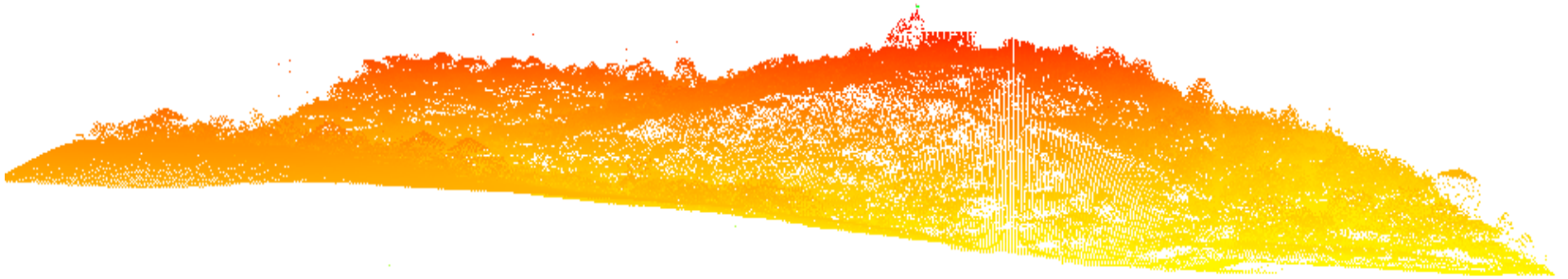
Las2dem

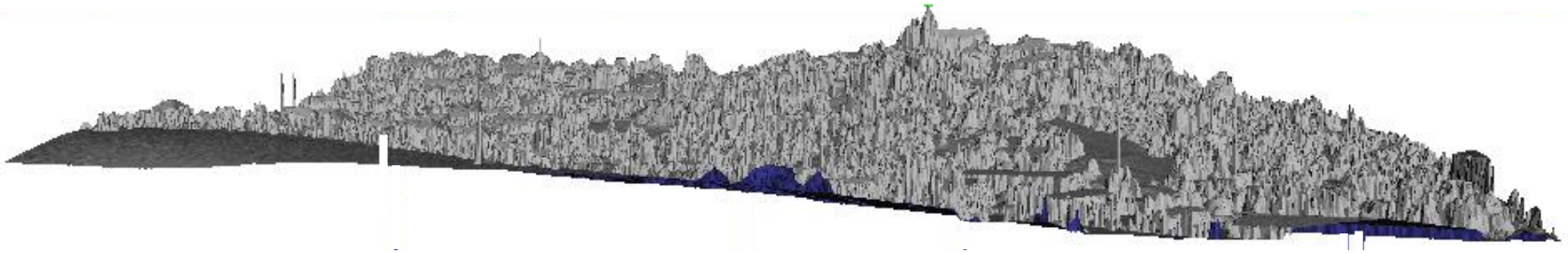
- Export as .bil + hillshade .bil

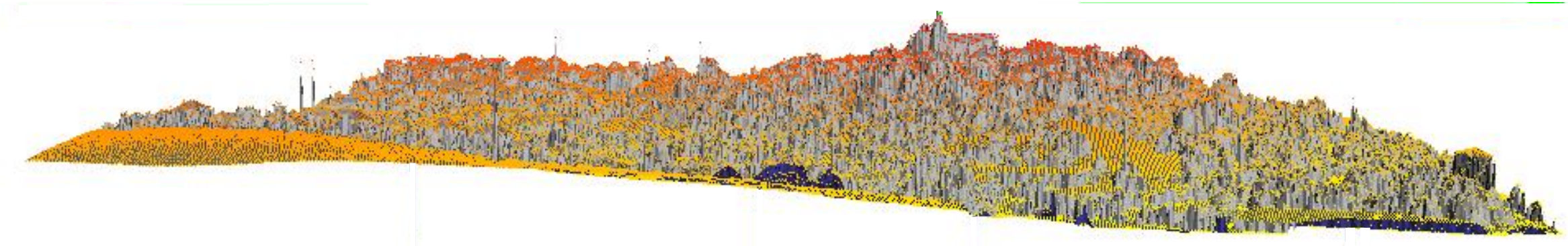
DSM (Digital Surface Model)

Las2dem

- Find your .las file
- Export as .bil + hillshade .bil
- View - color by..., triangulate







Contours

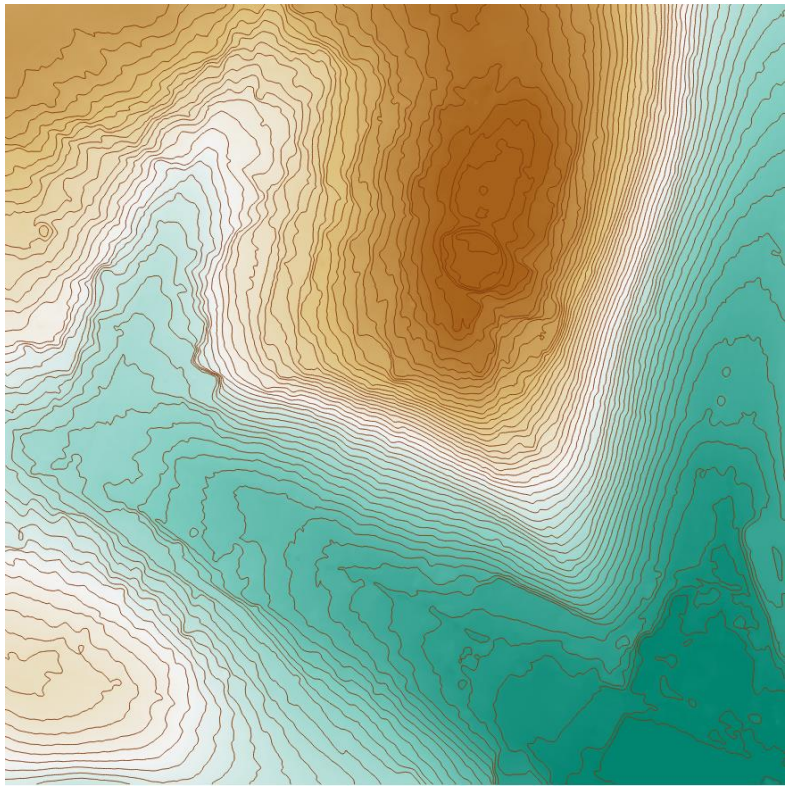
Las2iso (blast2iso)

- Find your .las DTM

  -iso_every 1.0 ^
  -smooth 2
  -simplify_length 0.5
  -clean 15 ^

- Export as .bil
- 3D Aanlyst

  - Add z

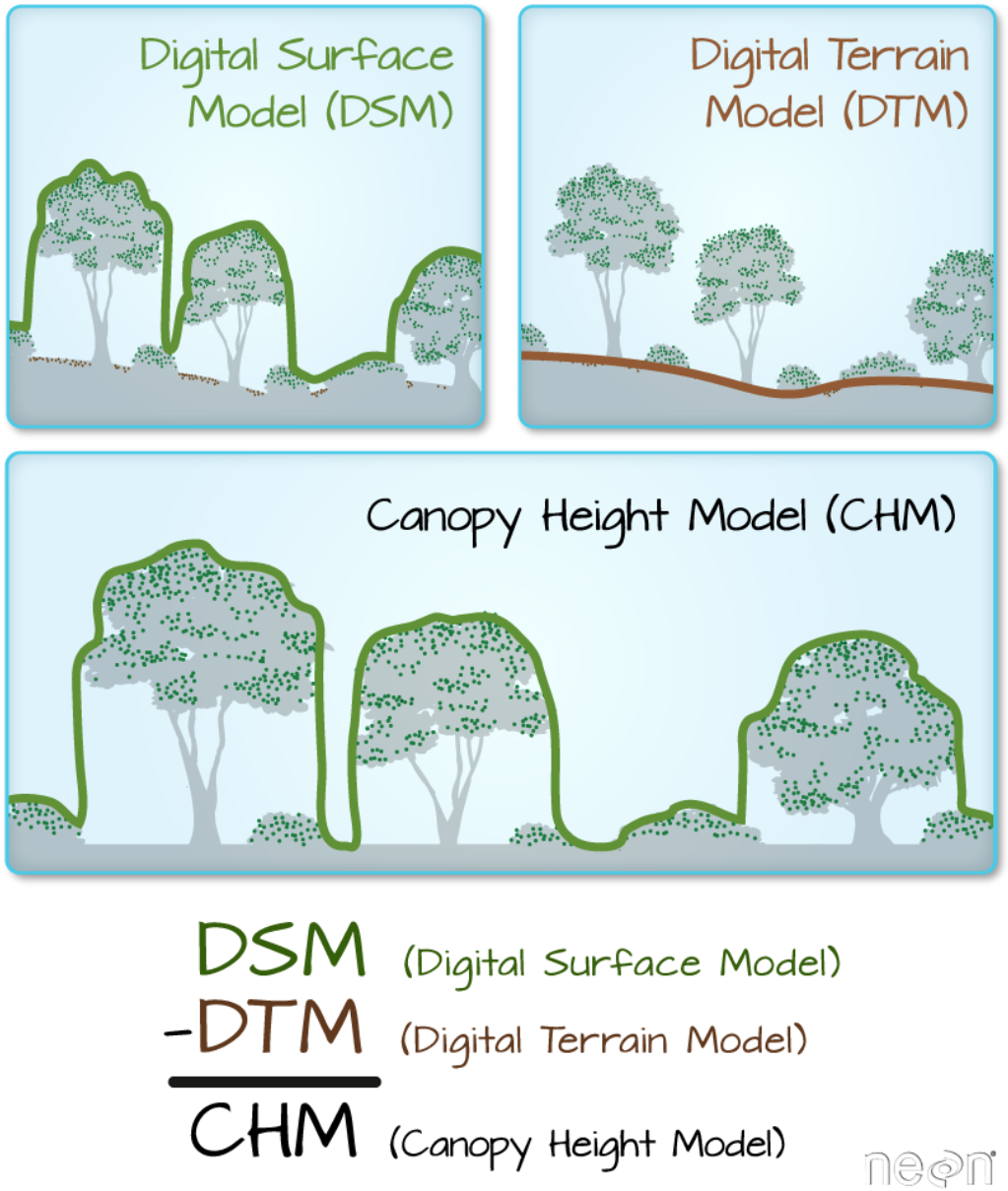


CHM (Canopy Height Model)

- Lasground
- Lasheight
- Lasgrid

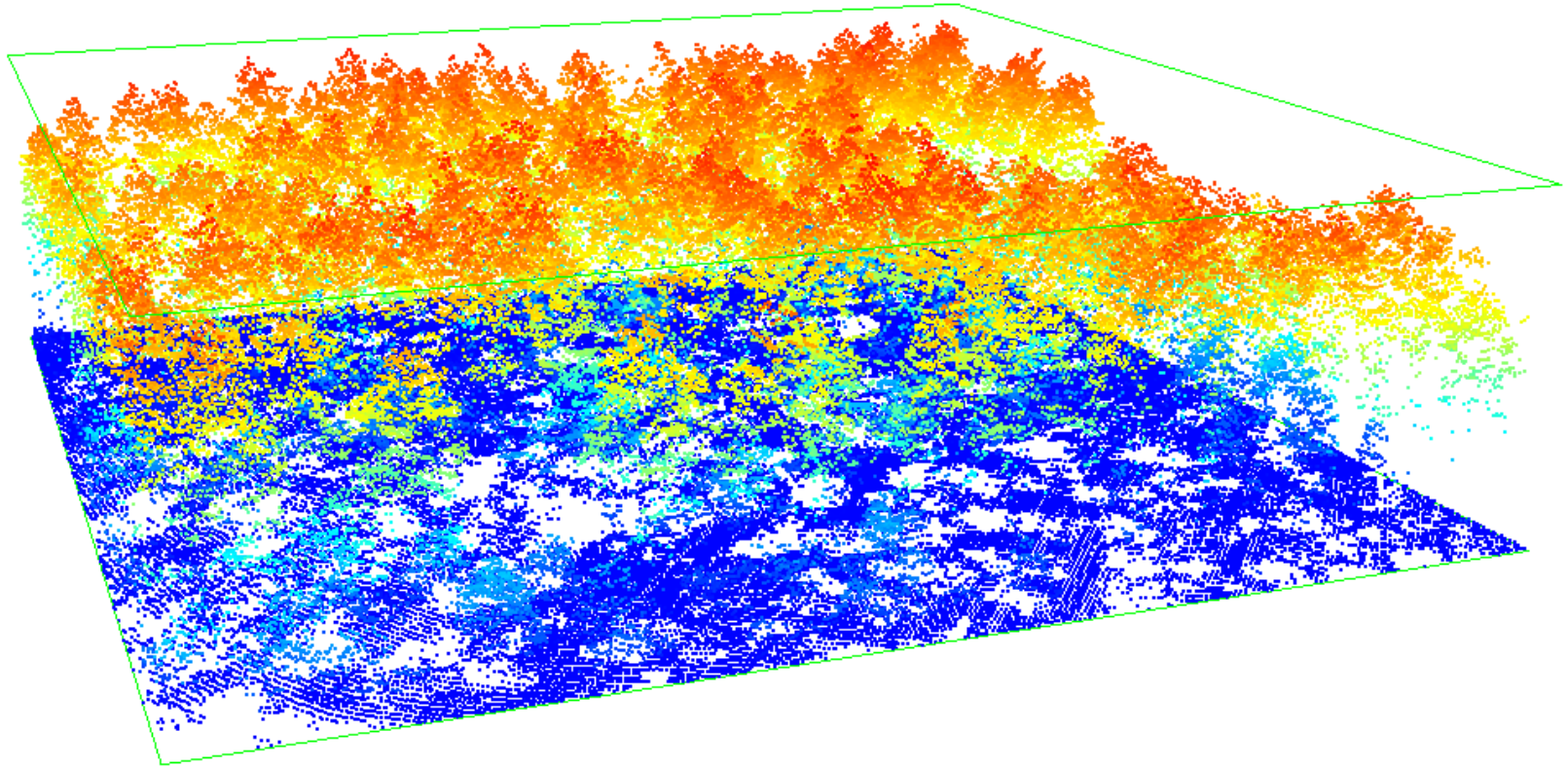
+ change parameters to reduce empty pixels

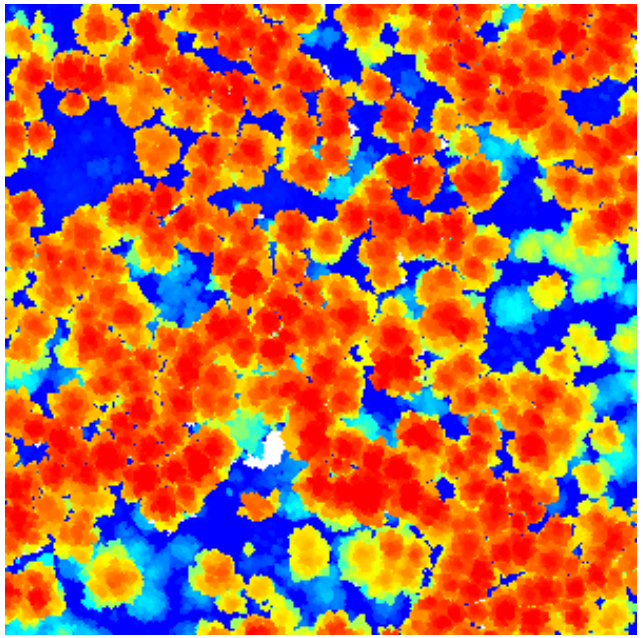
One way to derive a CHM is to take the difference between the digital surface model (DSM, tops of trees, buildings and other objects) and the Digital Terrain Model (DTM, ground level). The CHM represents the actual height of trees, buildings, etc. with the influence of ground elevation removed.



https://rapidlasso.com/2014/11/04/rasterizing-perfect-canopy-height-models-from-lidar/
https://earthdatascience.org/courses/earth-analytics/lidar-raster-data-r/lidar-chm-dem-dsm/

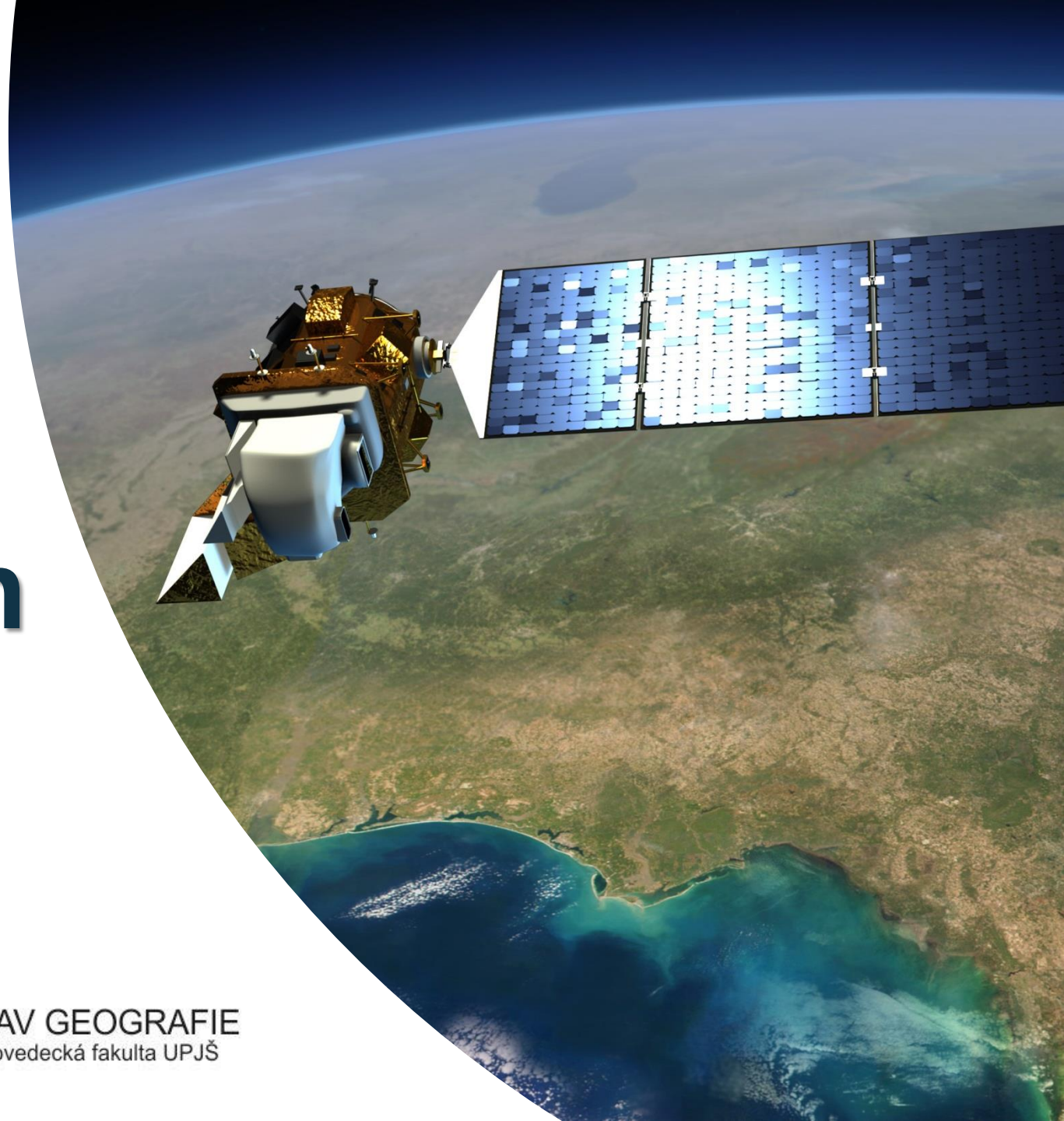
CHM (Canopy Height Model)





https://rapidlasso.com/2014/11/04/rasterizing-perfect-canopy-height-models-from-lidar/
https://earthdatascience.org/courses/earth-analytics/lidar-raster-data-r/lidar-chm-dem-dsm/

Thank you for the attention



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