
PdP Project : Generation of a 3D object from a Digital Elevation Model

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- **Context :**

Digital Elevation Models (DEMs) are 2D maps in which each point is associated with its height. They can be obtained through techniques such as photogrammetry, lidar, land surveying, etc. They represent the elevation of a terrain map (see Figure 1).

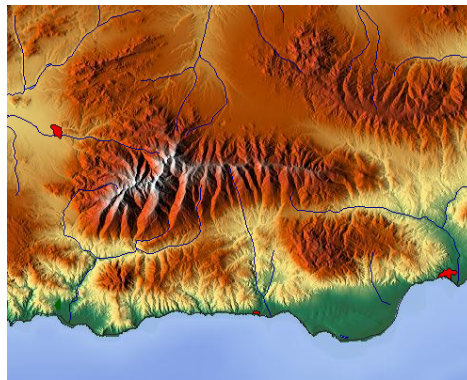


Figure 1 : Height map of the Sierra Nevada (source: Wikipedia)

Height maps can be obtained through several free sources and can represent terrain from earth, bathymetry (i.e. depth from the oceans) or space objects analysis (see Figure 2).

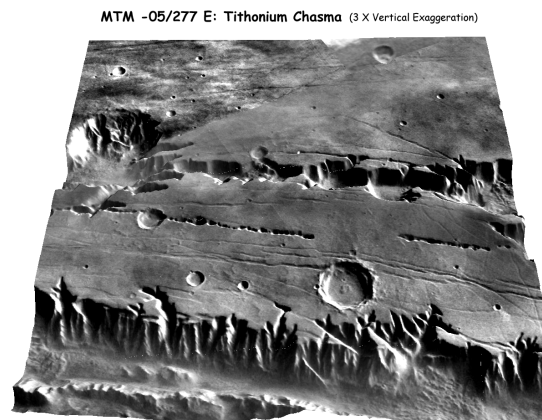


Figure 2 : Image taken from a Mars DEM (source : Wikipedia)

- **Objectives :**

The main objective of this project is to implement a software able to :

- Import DEM files from various formats

- Visualize them in 3D (with rotations, translations and zooms along the axis) (as in Figure 2)
- Allow the user to resize or to crop them using boundary boxes
- Create a support at its basis to transform it into a 3D object (see Figure 3)
- Add a fonctionnality to label it on (or below its support)
- Export the result in OBJ and STL formats

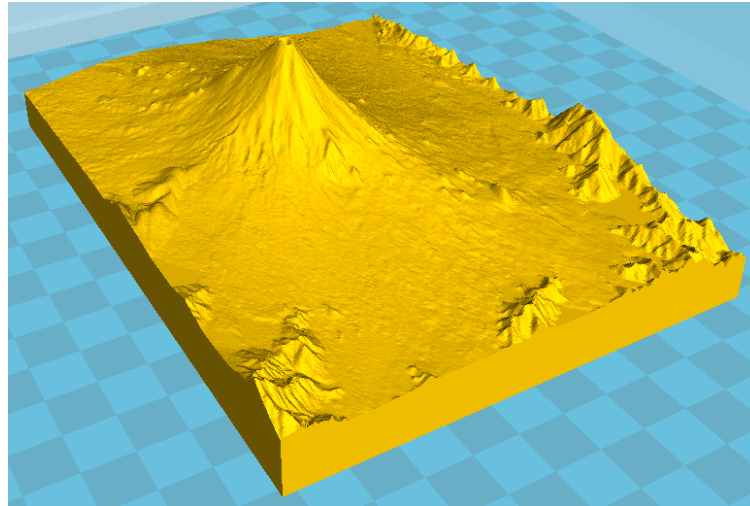


Figure 3 : DEM model (Mount Fuji, Japan) with its support, ready to be printed by a 3D printer