PROJECT 1 - Laser-Camera Triangulation & Point Cloud Reconstruction

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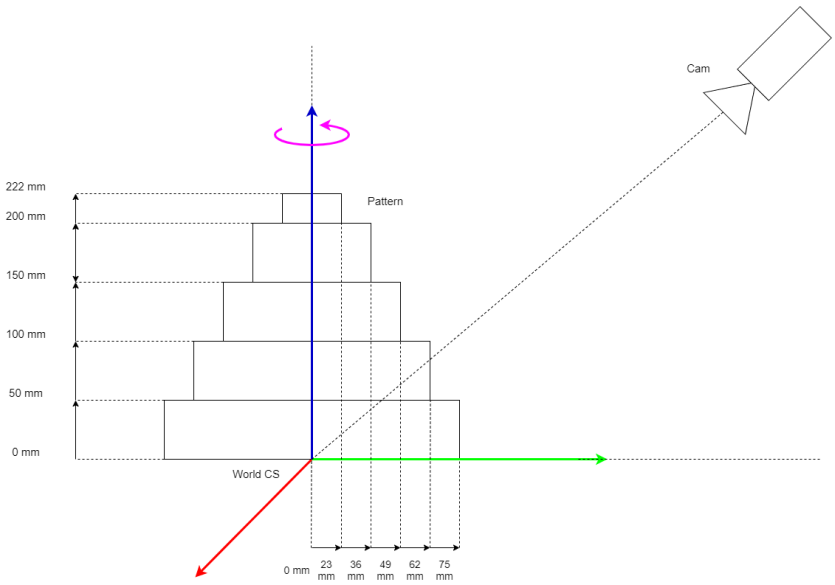
Instructions:

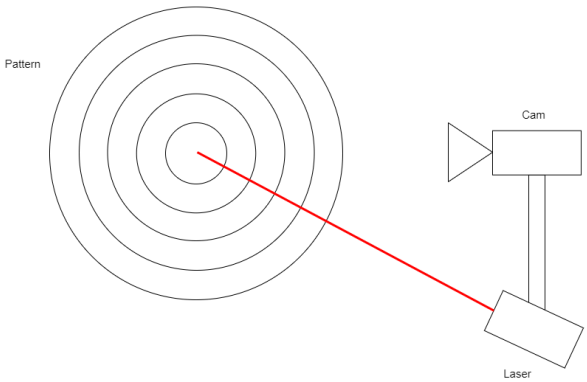
Part 1: Laser-Camera Calibration

Using the provided setup (Laser - Camara - Rotary Stage - Calibration Pattern) and based on the Direct Coordinate Mapping method compute the mapping function between 3D points in the world coordinate frame and the image coordinate frame and its. Lens distortion should be taken into account for lenses with short focal length. Implement a laser peak detector.

Display the RMS of the reprojected erros in the WCS due to your mapping function H.

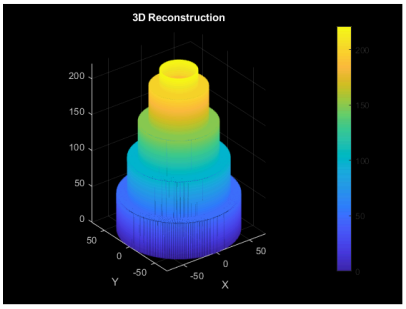
$$s\widetilde{m} = A[R \quad t]\widetilde{M}$$

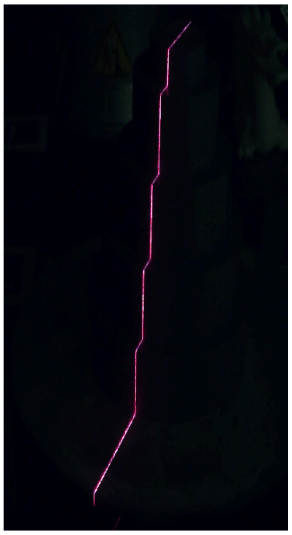




Part 2: 3D Point Cloud from revolution movement

Estimate the R matrix and compute revoluted 3D Point Cloud should look something similar to this:





Part 3: Car / Stanford Dragon 3D Point Cloud generation

Choose one of the 3D printed models and perform a 3D reconstruction based on your previous work , you should get results like the following