CMPEN 454 Project 2: Camera Projection Project

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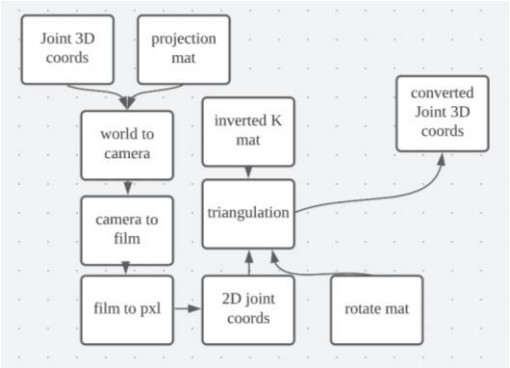
1. Summary

This project is about forward and inverse camera projection. By applying a series of calculations, the projections in both directions are achieved. The forward projection converts the 3D points (world coordinates) to 2D points(image coordinates). And the inverse projections take 2D points and converted them back to 3D points by triangulation. This project also required us to draw the epipolar line after detection

In this project, we are expected to read data from the mocap dataset and recognized the joint points in the mp4 file. The joint points are 3D points that represent the part like knees, elbows, and shoulders. After successfully realizing the program, the next steps are exhibiting the result in the Quantitative and Qualitative aspects, then evaluating the working efficiency in the algorithmic aspect.

2. Approach

This project contains these few parts: read the 3D data, read/verify camera parameters, convert 3D points to 2D points, convert 2D points back to 3D points, perform error analysis and draw epipolar lines. These contents are closely related to the contents of the lecture, which are conversion between world coordinates and image coordinates, triangulations, pinhole model, and Euclidean distances. The rough flowchart is following below:



3. Experimental observations