

HW 4 solution:

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To implement this process I decided to break it out into sections of more manageable sub tasks. I chose to first ensure I could read in the video. This was simple and pulled from old assignments. I then processed the frame for the aruco tag using a preloaded library of 100 aruco tags in a dictionary provided by OpenCV. Once I had the tag coordinates I found the pose of the tag using the built in `estimatePoseSingleMarkers()` function which produces a ratio and translation vector of the tag to camera based on camera intrinsics. I then needed to find a transformation of points relative to the tag location to camera/image space to project the pyramid with on the switch. I could've done this through straight Homogeneous matrix multiplication though chose to use `projectPoints()` as I liked how simple it was when using it in lab 6 and felt it would apply nicely here. At this point I simply need to draw the lines connecting the 5 projected pyramid points. Overall this was fairly straightforward though I would like to see performance of this method versus straight matrix multiplications.

Video Link:

<https://drive.google.com/file/d/1UPFKSsblZRU7ftyflmrugxM3DVnzXaE6/view?usp=sharing>

Personal:

<https://drive.google.com/file/d/137Mdp8qSsUFmf3KSfTsH74EdzEt5FmiN/view?usp=sharing>

Note: personal is far more stable at end of video