

### Lab 3: Structure from Motion



FIGURE 1. *Object to be reconstructed.*

#### Part A Results.

- The affine reconstruction through factorization algorithm seemed to perform relatively well on this particular data based on the resulting reconstruction. It is possible that the scene was shallow enough to get a reasonable depth approximation.

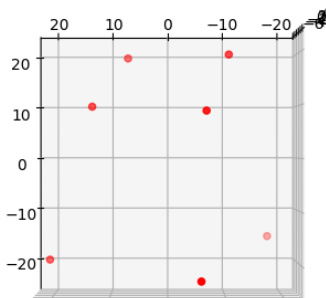


FIGURE 2. *Affine reconstruction through factorization.*

#### Part B Results.

- The affine reconstruction through factorization algorithm seemed to work fairly well on our tracked points from the captured video. Most of the issues with depths being off seemed to lie in errors resulting from poor tracker performance. So this approach works sufficiently well when the object can be reliably tracked, otherwise, there will be significant misalignments in the reconstruction.

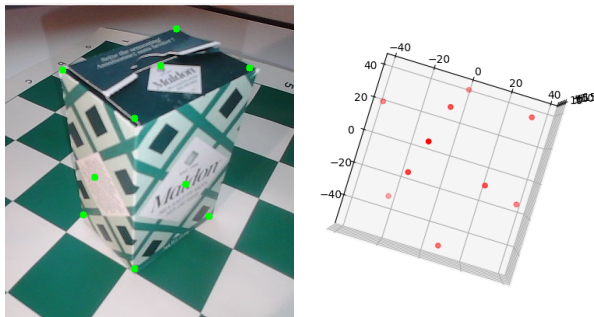


FIGURE 3. *Affine reconstruction through factorization on tracked points.*

### Part C Results.

- In theory a projective reconstruction should be more accurate than the reconstruction from an affine algorithm, as it accounts for variation in depth while affine models do not. However, our projective reconstruction does not seem to be very accurate. The left base point seems to align with the roof points (the base should be wider than the roof), and the roof points do not all lie on the same plane (this should be the case). This may be due to an issue with our depth estimation approach more so than with the projective algorithm, as there seems to be a sufficient amount of depth information in captured frames.

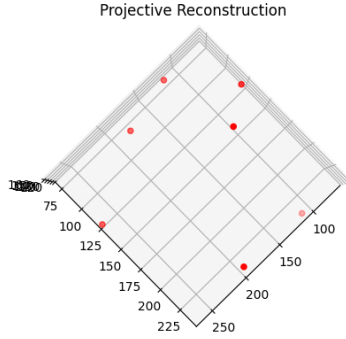


FIGURE 4. *Projective reconstruction through factorization.*