# 2025 Spring CV HW4

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## Contents



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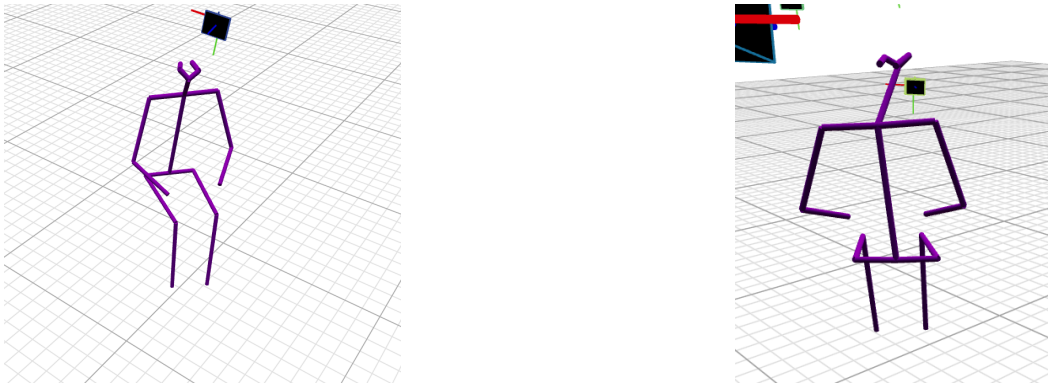
# 1 Single person reconstruction

Reconstruction was done with the `single_person_0` dataset.

## 1.1 Two view

The whole person is reconstructed from two views, as shown in Figure 1.



(a) Front view (b) Back view

Figure 1: Two view reconstruction of a single person.

## 1.2 N view

The whole person is reconstructed from multiple views, as shown in Figure 2. The pose is slightly different from the two view reconstruction in Figure 1.

(a) Front view (b) Back view

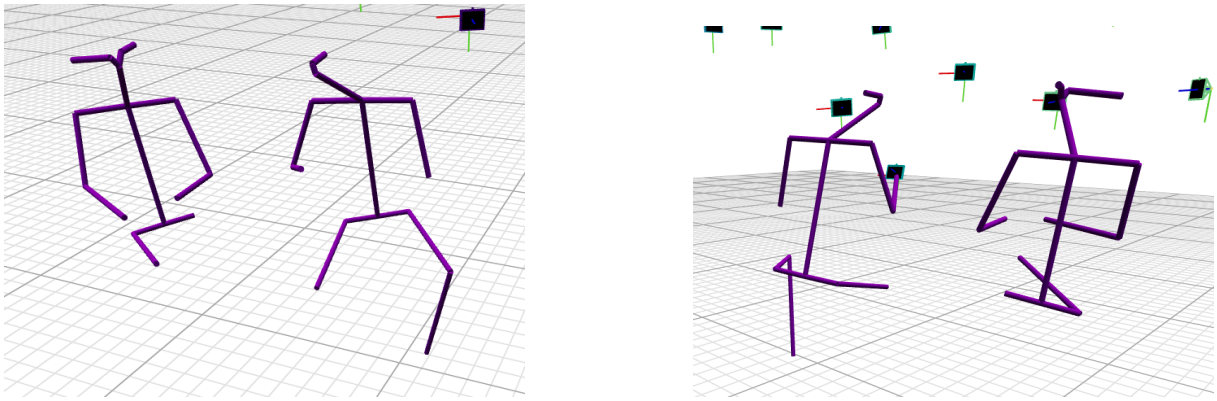
Figure 2: N view reconstruction of a single person.

# 2 Two person reconstruction

Reconstruction was done with the `single_person_1` dataset.

## 2.1 Two view

Two persons are reconstructed from two views, as shown in Figure 3. But due to low confidence values for some joints, the reconstruction is not perfect. Both persons are missing some joints such as legs and arms.



(a) Front view (b) Back view

Figure 3: Two view reconstruction of two persons.

### 2.2 N view

Neither person is fully reconstructed from N views, as shown in Figure 4. Only both the head and half of one person's upper body are reconstructed. This leads me to believe that either confidence values for some joints are too low, or the more likely cause is that the triangulation between multiple cameras does not work.

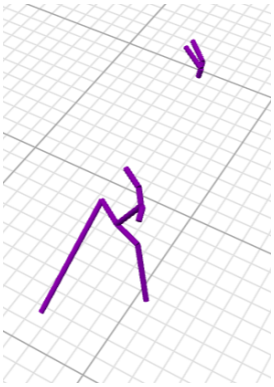


Figure 4: N view reconstruction of two persons.

## 3 Multi person reconstruction

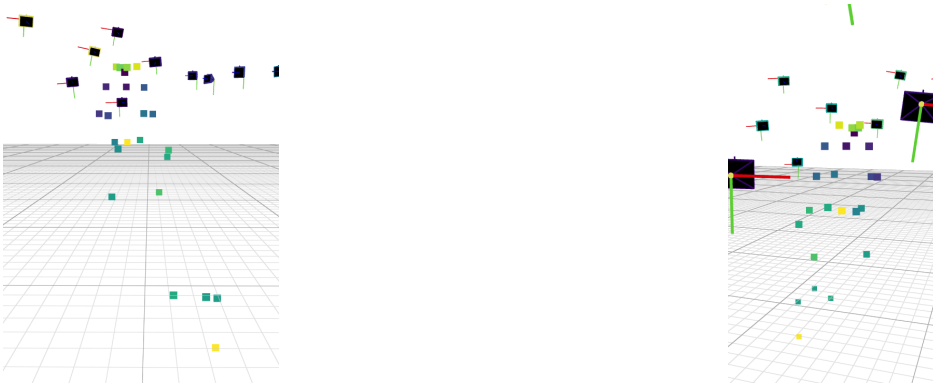
Reconstruction was done with the `two_person_1` dataset.

### 3.1 Joint voting

The joint voting resulted in the joints of one person and the second person completely missing, as seen in 5. This also indicates a potential issue with the triangulation process. There are also some joints under the floor, even though the minimum Z is set to the recommended -0.1. This meanwhile shows that there might be a problem with how the coordinates are transformed from the voxel space to the world space.

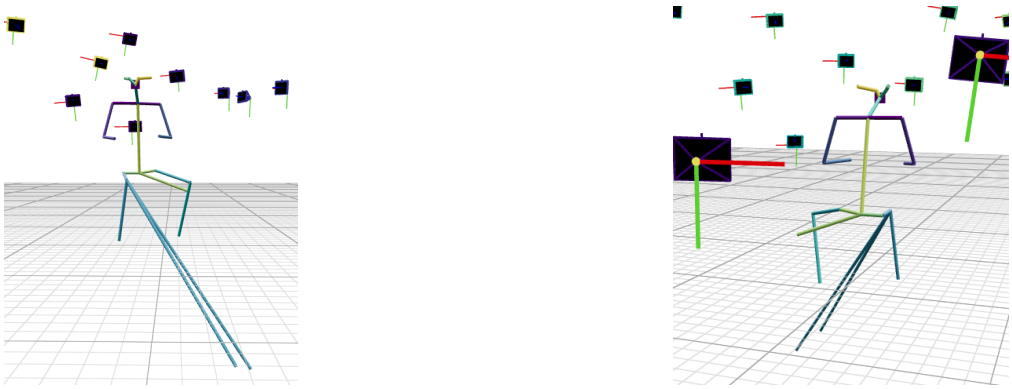
### 3.2 Bone voting

Bone voting worked well even with the missing joints and outlier points. As seen in Figure 6, the bone connections are more robust to occlusions and can infer the missing parts better than joint voting. If the joint voting would be improved, the bone voting would also improve.



(a) Front view (b) Back view

Figure 5: Joint voting results.



(a) Front view (b) Back view

Figure 6: Bone voting results.

### 3.3 Skeletal proposals

Only one skeletal proposal was generated, as shown in Figure 7. This is also due to the fact that the joint voting did not work well. Echoing the effects through the bone voting, the skeletal proposals work, but they are limited by the initial joint detections.

(a) Front view (b) Back view

Figure 7: Skeletal proposals results.

### 3.4 Refining skeletons

This step was not implemented due to time constraints.