Report week 6

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1 Speeding up rendering

- Tested NiTE2's tracker for kinect2 (video).
- Implemented manual method for constraining keypoints.

1.1 Results

To constrain the human body, we implemented a scaling function based on the weighted sum of all the observed keypoints. However, the results are varying:

True Height:	1.72
Average:	1.84
Median:	1.49
Average deviation from median:	0.51

Table 1: Results from approximatley 2 seconds of observation where the subject is standing still with a clear view to all keypoints.

Some other problems were also discovered, such as if a keypoint between two well observed keypoints is not observed well, we should have a method to calculate where this keypoint *should* be given the scaled lengths of the limbs between the keypoints.

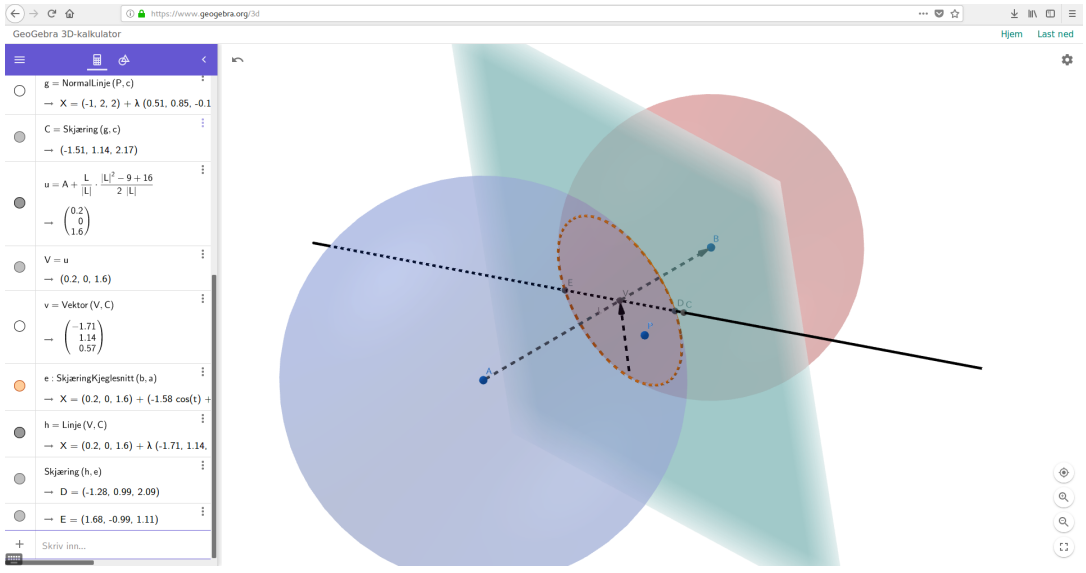

Figure 1: The candidates (D,E) for the estimated position of a not-well-observed point P between two well observed points A,B. C is the point P projected into the plane created between the intersection of the spheres around A,B with radius equal to the respective wanted limb lengths.

1.2 Observations

- The NiTE2 program seems to use a skeleton with *fixed* lengths, although it is scaled to the person.
- It looks like the software produces a full 3D skeleton as long as enough keypoints are tracked.
- Direct data from the NiTE2 seems to be a little unstable. For games, this data is probably filtered.
- NiTE2 seems to track best between 160 – 400 cm from the sensor.

1.3 Problems/Next week

- The code for manually refining the 3D keypoints is still a little buggy/unfinished. I would like to look into creating a ML model for estimating the 3D keypoints, since this is what the NiTE2 software uses.
- Complete tracking of each person based on CoM of the observed keypoints.