**CAS – Assignment 1 Report**

1. I’d suggest to use an erosion algorithm with a really small structuring element as the two vertebraes are only connected by a single voxel. I choose this algorithm, as it will slightly reduce the image and therefore separate the vertebraes. This, though, might also be a downside as the vertebraes will be slightly smaller after the algorithm has been run. However, I think that’s negligible.
2. To improve the segmentation on a picture with salt & pepper noise, I’d use a median filter. A median filter is better than for example a gauss filter (which could also be used) because it is not affected by spikes. This allows to filter spikes (which salt & pepper clearly is) without making the picture blurry.
3. We need the entry point, the target seed and the length from entry to target. Further would be helpful to know what kind of tissue/bone is between entry and target and if there are any nerves/veins on the way.
4. To get a surface model of the segmentation, a edge detection algorithm can be used. There are many different ones such as morphological or gradient based ones. The best, however, is the canny edge detection.
5. It’s 2^k times faster. In this case 2^6 = 64