TTK4255 - Assignment 1

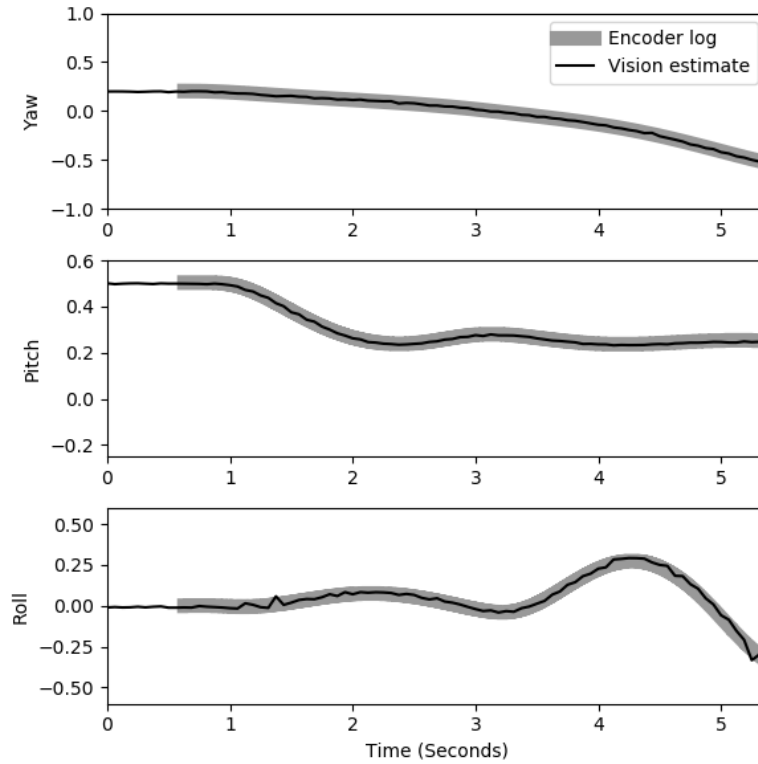Written by Dinosshan Thiagarajah

Task 1

Task 1c:

Figure 1: Estimated pose against the logged encoder values

Task 1d:

The roll markers are not detected at image 87, meaning $J^T J$ is singular (roll column in zero), which again means that the normal equation can not be solved.

Task 2

Task 2a:

It takes approximately 4 iterations before the estimates stabilize to 0.001 radians precision. λ explodes to infinity (multiplied by 10 each iteration) since the error could not be further improved.
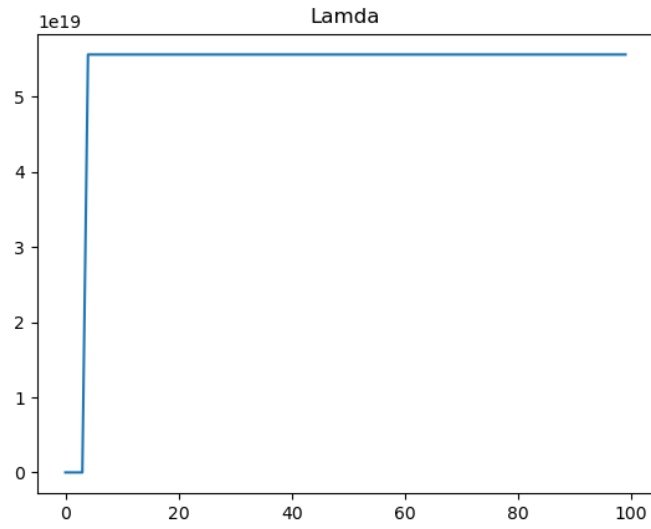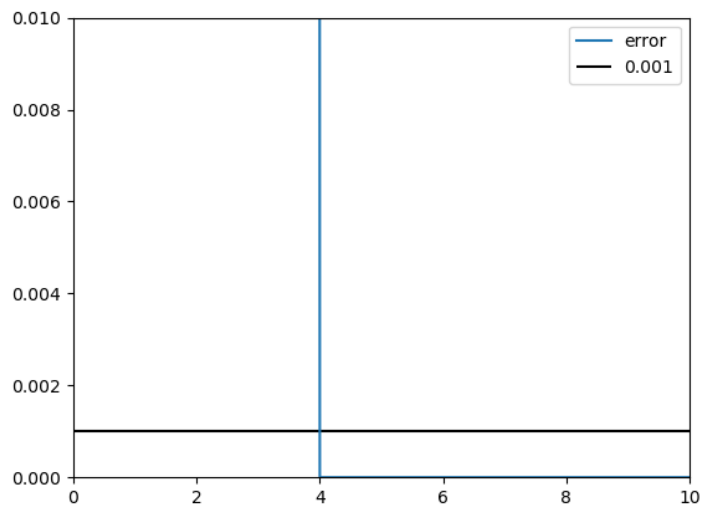
Figure 2: Lamda for the first image using LM

Figure 3: Estimation error for the first image using LM

Task 2b:

With the LM method, error is not occurring. This is since $J^T J + \lambda D$ does not become singular due to D (identity) matrix in the equation.
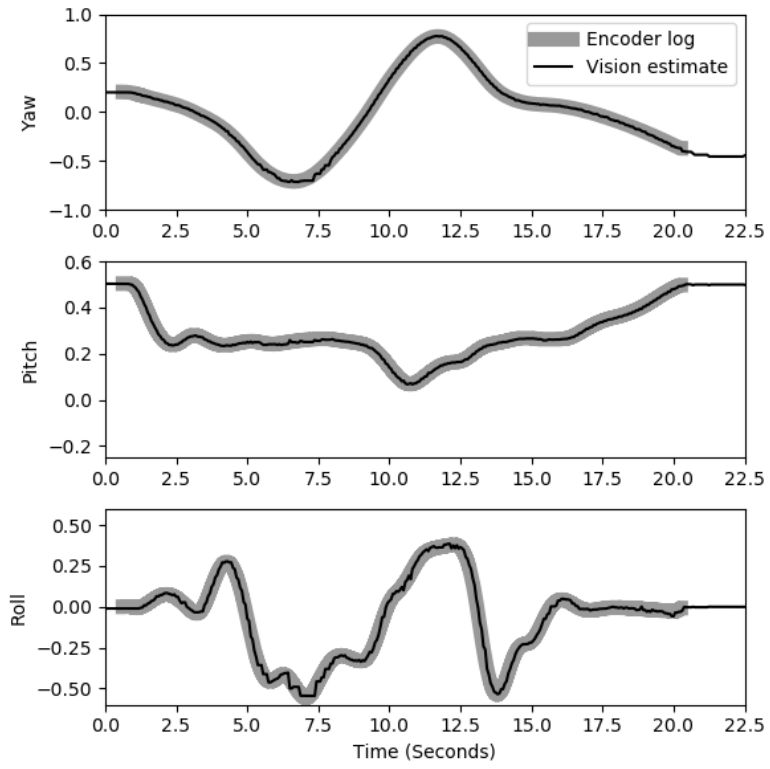
Task 2c:

Figure 4: Pose estimates against encoder values for entire image sequence