School of Informatics

Advanced Vision INFR11031

Coursework 2:
Feedback for s2006423/s1886154 Draft Report

s1983630
s1795504
11th March 2020

1 Introduction

Add summary of methods and algorithms used at each stage/challenges and lay out structure of report as in the brief document.

2 Preprocessing

Good overall and nice images - use of erosion, thresholding of z axis and saturation mask, border removal demonstrated. Could you further remove points (higher saturation threshold) to leave just the 3D head? may help with next stages from our experience. Square morphological erosion most appropriate? maybe try using disk, but this is a small detail. Are there any other issues? What about certain frames/other subjects (image sets 2-4)? Do the preprocessing steps work for all frames and subjects properly? If so then simply stating this would add clairty.

3 Frame Fusion

Break down into Rotation and Transformation Estimation then Frame fusion separate sections. Try to place figures better in relation to discussion.

Is SURF the best, why not SIFT? Was RANSAC tried? Did it fail at all if used with RANSAC due to too few points? How did you determine if features were a good match? Studies suggest that SURF helps speed up the process but if time is not a factor SIFT can be better due to its higher quantity of identified features - external sources may be useful.

Is procrutes function better than RANSAC? why? How does it perform when combined with pcregistericp or similar functions. Try ensemble of these approaches, how does that change the results. You don't need to explain every matlab function (i.e. pcmerge and matrix transformations), only the main algorithms used.

4 Challenges

More detail on why you weren't able to index into 3D pc needed. Was this to do with number of features found or a more general/generic in MATLAB? Including the problematic code here could have resulted in helpful feedback.

If feature finding is an issue, consider searching within a masked area for SIFT/SURF points as this has helped in our case.

Good discussion of vertical displacement but infers that transformation estimation might be the problem. Discussion/evaluation of different functions such as estimateGeometricTransform(RANSAC) or pcregistericp() might be worth including here.

5 General Feedback

The report sections could maybe be structured to reflect the sections of the assignment brief better (e.g. translation and rotation as a seperate section from frame fusion). A final section for building the best model and evaluation methods could be added too but obviously the work is not at this stage yet.

In general, it seems like you have a good grasp of all the required processes and have identified some key challenges. The work was clearly in an early stage and you have acknowledged this by mentioning some aspects that will be updated/included later to reflect the requirements.

The main thing to consider is remember to justify the chosen algorithms, its less essential to explain them in detail, but the reason why they were preferred over the others available for each task should be discussed. This way credit can be given for sufficient knowledge and model design, even if the implementation does not produce the desired quality of final results.