

**Exercise sheet 12 for MA-INF 2201 Computer Vision WS22/23**  
**25.01.2023**  
**Submission on 01.02.2023**

1. The `Hotel` dataset is provided in the *data* folder with images and 2D feature points. Visualize the 2D features in each view by creating a small animation using *matplotlib*. For each view plot the corresponding features and the centroid.  
(2 Points)
2. Implement the Tomasi-Kanade Structure-from-Motion algorithm as presented in the lecture and apply it to the `Hotel` dataset.
  - (a) Implement the Algorithm and show the results as a 3D *matplotlib* plot.  
(8 Points)
  - (b) Eliminate the affine ambiguity, update the motion and shape matrices and show the results as a 3D *matplotlib* plot  
(6 Points)
  - (c) Depict the reprojection error of the shape by overlaying the initial 2D features and the 2D projection of the 3D shape vertices on each frame.  
(4 Points)