**ASSIGNMENT - Additional**

(Optional, for compensating upto 10 marks of MS component subject to not exceeding 20 after adding with the MS exam paper marks under this head).

**Instructions**:

**1) Implement your codes in Python3 with necessary user's interfaces and visualization of your results and input. Packages can be used in each step.**
**2) Provide documentation for compiling and running the programs in a README file.**
**3) Place your ".py" files along with all the generated outputs and README file in a folder. Submit the zipped folder on Moodle.**

***(a)*** Given two images of the same scene develop a graphical interface for recording a pair of corresponding points. [20]

***(b)*** Consider a pair of stereo images of the same scene (Baltimore_A1.jpg and Baltimore_A2.jpg). Given the height and width of the reference image (Baltimore_A1.jpg) is H and W, suppose its calibration matrix is given by the following matrix.

$$K = \begin{vmatrix} -H/2 & 0 & H/2 \\ 0 & W/2 & W/2 \\ 0 & 0 & 1 \end{vmatrix}$$

***(i)*** Compute the homography H induced by the plane at infinity. [20]

(Hint: Select corresponding pairs of points from distant objects.)

***(ii)*** Estimate the Rotation matrix R for the second camera, assuming the reference camera centric coordinate system. [20]

(Hint: Estimate R from H and K. )

***(iii)*** Estimate the fundamental matrix. [20]

(Hint: Use the method of 8 point correspondences. )

***(c)*** GUI and visualisation. [10]
***(d)*** Write a detailed report explaining the results you have got. [10]