CS 6790 : Geometry & Photometry-based Computer Vision

Programming Assignment 2

Instructor: Dr. Anurag Mittal (BSB 368)
amittal@cse.iitm.ac.in

Please compute the image of the absolute conic ω and camera calibration matrix K, given one or a few pictures from a single camera:

1. By assuming a full K matrix,

   (a) by using 5 perpendicularity relations between vanishing points.
   (b) by computing the homography relation between a metric co-ordinate system fixed to the scene plane and the image of the same. (3 such homographies are needed).

2. By assuming square pixels (i.e. skew = 0 and $f_x = f_y$:

   (a) by using 3 perpendicularity relations between vanishing points.
   (b) by computing the homography relation between a metric co-ordinate system fixed to the scene plane and the image of the same. (2 such homographies are needed).

Please do the above for the set of pictures for which the particular case can be applied.

- **Suggested Programming languages :** Python/Matlab

- **Dead line : March 11**

- **Images for Assignment :** https://goo.gl/nWohJo. You may resize and crop images for faster processing.

- **PDF Upload:** https://www.turnitin.com Class ID: 17456076 Enrollment Key: CS6790
  Naming format: RollNo_FName_2.pdf Ex CS15D001_Amitabh_2.pdf

- **Code Upload:** Using Moodle. Naming format: Same as pdf with .zip or .tar.gz extension.

- **PDF Instruction:** PDF should contain: i) Results ii) Brief of concepts applied. PDF should NOT contain codes.

- Email submissions will not be accepted. Reduce file size (if required).

- **TAs:**

  – Ashish Mishra (mishraashish632@gmail.com), BSB 374
  – Gouthaman KV (gouthamankv@gmail.com), BSB 374
  – Vikram Singh (vik1409@gmail.com), BSB 374