Tutorial Week 8 Structure from Motion from TWO views

Today we will learn about a concept of structure from motion.

Follow the example “**Structure from Motion From Two views“** by searching for the name.

1. Use the dataset that come with the example (upToScaleReconstructionCameraParameters.mat)
2. Pay attention to new functions:
   * Create the point tracker (vision.PointTracker)
   * Track the points (step)
   * Estimate the fundamental matrix (estimateEssentialMatrix)
   * Compute the camera Pose (relativeCameraPose)
   * Compute extrinsics of the second camera (cameraPoseToExtrinsics)
   * Compute 3-D points (triangulate)

Homework — to be completed before 11am on Monday 18 September:

1. Using your two images - reconstruct the 3D point cloud
   * Use ‘cameraCalibrator’ app to estimate parameters of a single camera
   * Use ‘checkerboard’ to create a checkerboard image for camera calibration
2. Upload the Jpeg image of the Point Cloud to MyLO discussion topic (“structure from Motion TWO viewers)

Process:

1. Generate checkerboard

I = checkerboard(20);

Figure

Imshow(I);

1. Take photos of checkerboard more than 10

Beware of the size of the checkerboard == the real visual/physical size

1. Open cameraCalibrator -> import images with 20 -> calibrate -> export parameter

References:

Single Camera Calibration App: <https://au.mathworks.com/help/vision/ug/single-camera-calibrator-app.html?requestedDomain=www.mathworks.com>

**Camera Calibrator:** [**https://au.mathworks.com/help/vision/ref/cameracalibrator-app.html**](https://au.mathworks.com/help/vision/ref/cameracalibrator-app.html)