**Spring 2013 CSCE 867: Computer Vision**

**Project #1**

Due time: Thursday, Feb 28th, before class ends

**Part 1**: **Camera calibration using linear method**

* Implement the conventional camera calibration method introduced in class – estimating camera parameters from the projection matrix using 2D-3D correspondence either in c++ or matlab.
* Perform experiments on a given data set and estimate the calibration performance in terms of projection error. You may only use part of the data for calibration, and the remaining data for error analysis. The projection error can be defined as

where N is the number of points for error analysis. is the ground truth (given) image point and is the estimated image point by projection.

**Part 2: Robust camera calibration**

As introduced in class, we can use the RANSAC method when there are outliers in the data.

* Implement the RANSAC method and perform experiments on the given data set and estimate the calibration performance in terms of projection error.
* You can assume the whole data set may contain up to 20% outliers.

**Requirement**: you need to submit your project through dropbox including

1. A written project report includes a brief introduction on the addressed problem, a succinct description on the methods you implemented with the major steps, the experimental results and analysis, conclusion, and reference.
2. Code with appropriate comments.