Practical 2 : 4 pts vs 2+1pts

The goal of this practical is now to compare the classical linear 4 points algorithm and the linear 2 points knowing the vertical direction of the camera.
Let's consider 50 points randomly distributed in a plane of equation $N^T X_w + d = 0$ in the world frame (O_w, X_w, Y_w, Z_w).
Let's note respectively, $(O_{c_1}, X_{c_1}, Y_{c_1}, Z_{c_1})$ and $(O_{c_2}, X_{c_2}, Y_{c_2}, Z_{c_2})$ the camera positions. We suppose a calibrated camera posed at a rotation R_i and T_i of the world coordinate $(X_w = R_i X_{c_i} + T_i)$.
The image points are noted P_i.

Preliminary questions

This practical is in relation with our first exercice "Homography estimation using IMU : 2+1 method". The algorithm is given in the file `Practical2.m`.
Read, run and comment this file.

Comparison

1. Test 1 : example with different datas, propose a test with different positions of the second camera $(R_1 = I, T_1 = 0)$ with angles of rotation between $0°$ and $45°$ and translation of 0 to 100
2. Test 2 : example with noise, propose a test with different camera positions $(R_1 = I, T_1 = 0)$ with angles of rotation between $0°$ and $45°$ and translation of 0 to 100 AND white noise in image points of camera 2 between 0 to 1 pixel std (use RANSAC functions).
3. Test 3 : example with noise on IMU informations, propose a test with different camera positions $(R_1 = I, T_1 = 0)$ with angles of rotation between $0°$ and $45°$ and translation of 0 to 100, white noise in image points of camera 2 between 0 to 1 pixel std AND white noise in IMU between $0°$ to $2°$ (use RANSAC functions).
4. Conclusion...