

Assignment 4

- ❖ Please download a fresh copy of the assignment and MATLAB functions to display the rotations - they have both been updated.

Assignment 4 Q2

- ❖ Old world frame (wrong)



Assignment 4 Q2

- ❖ New world frame (correct)



Nonlinear Pose Estimation: MATLAB

Additional parameters

MATLAB:

```
err = @(p) reprojerr(p,K,x,X);  
options = optimoptions('lsqnonlin','Algorithm','levenberg-marquardt');  
p = lsqnonlin(err,p,[],[],options);
```

Initial guess

- ❖ **reprojerr** is a user-supplied function that returns a column vector of signed deviations (not squared).

Assignment 4 Q2-3

- ❖ Be careful with MATLAB functions **rotationMatrixToVector** and **rotationVectorToMatrix**. They are self-consistent, but do not use the right-hand rule.

Assignment 4 Q3

- ❖ To report your bootstrapped uncertainty in the estimated rotation matrix, report the RMS angular deviation (in deg) between the bootstrapped frames and the ML frame.
- ❖ Recall that the relative rotation \mathbf{R}_{12} between two rotations \mathbf{R}_1 and \mathbf{R}_2 is $\mathbf{R}_1\mathbf{R}_2^{-1}$
- ❖ This can be converted to an angle using the MATLAB function **rotm2axang**.

Project Demos

- ❖ This Mon Dec 3 4pm-6pm in Bergeron 211
- ❖ Each demo should be no more than 5 minutes long
- ❖ The order of presentations will be random

Course Evaluation

- ❖ I will be reserving a few minutes at the end of the lecture to give you time to complete the online course evaluation for our course.

- ❖ Course evaluations are important for a number of reasons:
 - To inform curricular review and improvement;

 - To provide students with course feedback to make informed course selections;

 - To help mentor faculty and select candidates for teaching awards;

 - To provide Tenure & Promotion committees with individual teaching and comparative data.

- ❖ Please take the time to complete an evaluation for our course. Comments are particularly helpful.