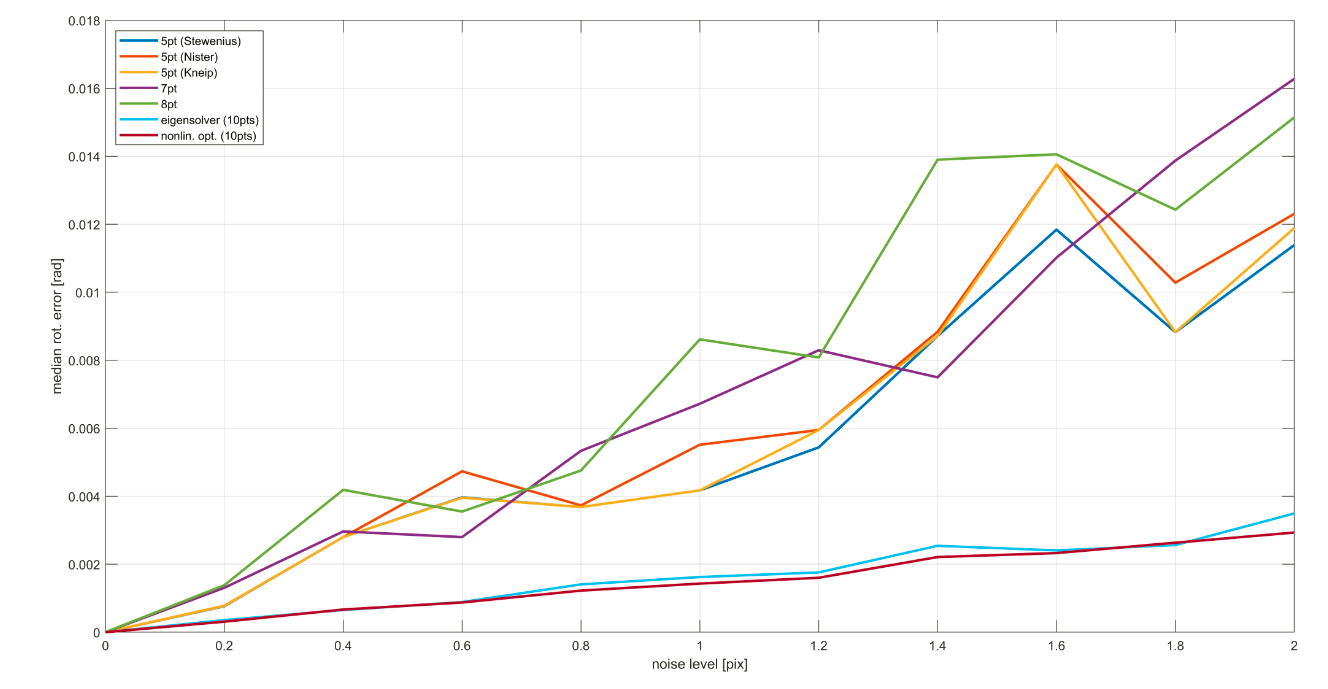
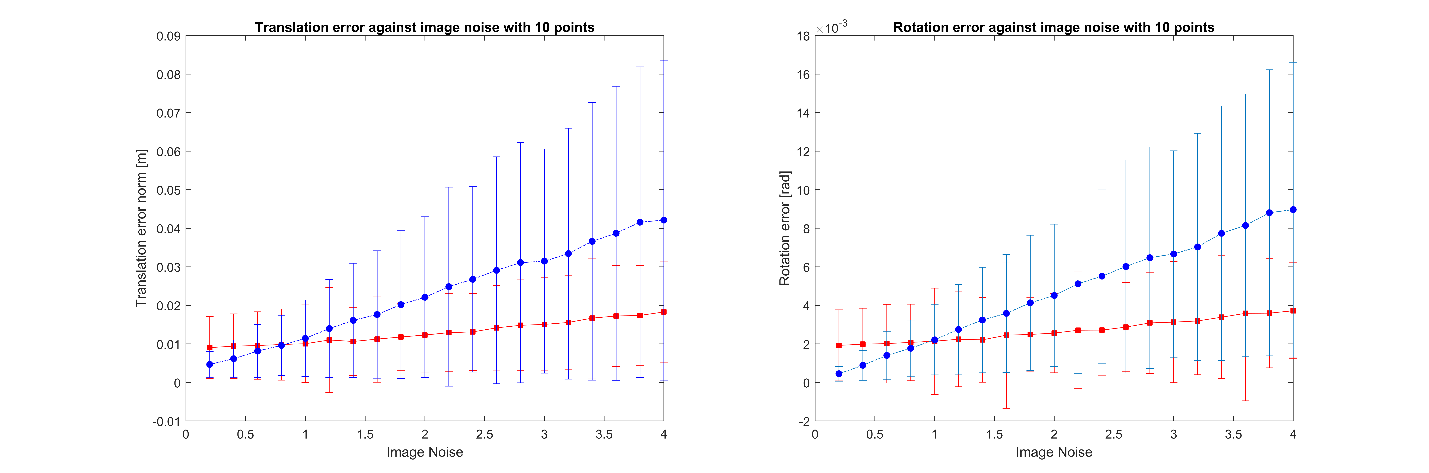
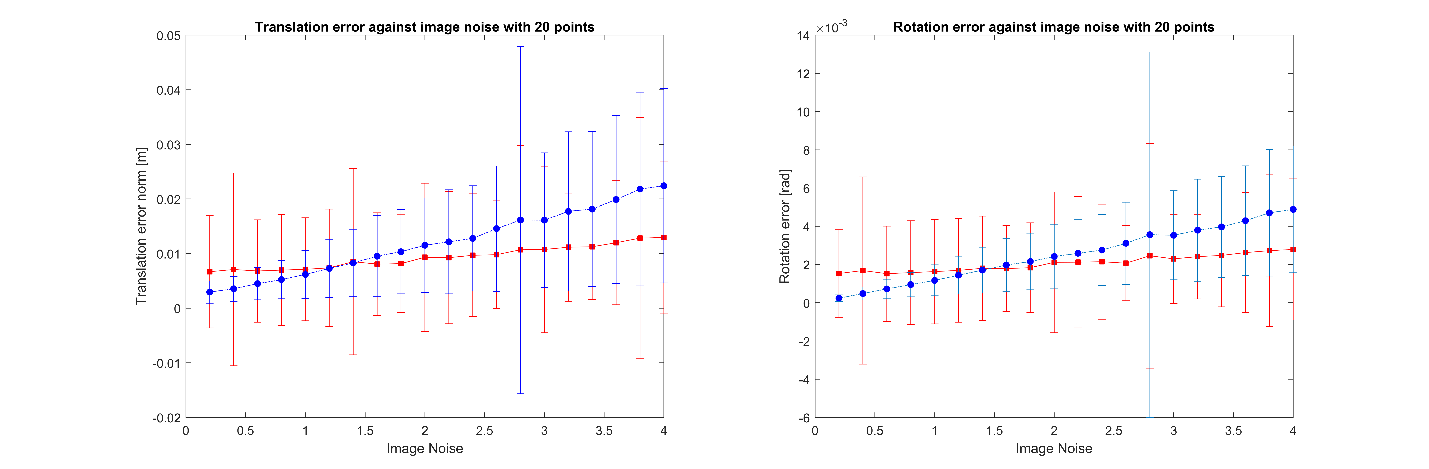
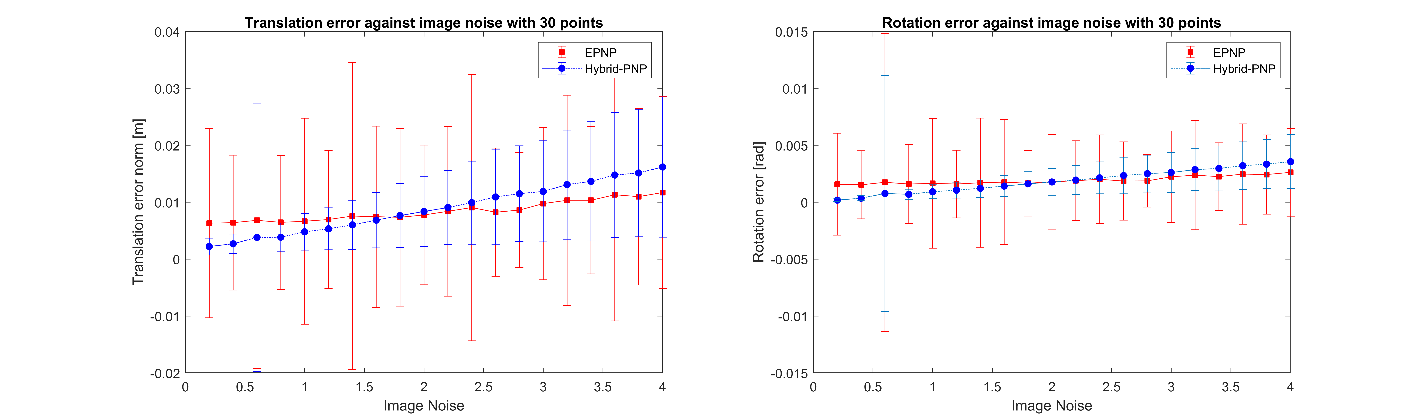
I have replaced the 2d-2d part of the Hybrid-PnP from 8-points to eigensolver, which is more accurate according to the paper “Direct Optimization of Frame-to-Frame Rotation”. And I have run its code and generated the result shown in the following figure, which is almost similar to Fig. 4 of the paper.

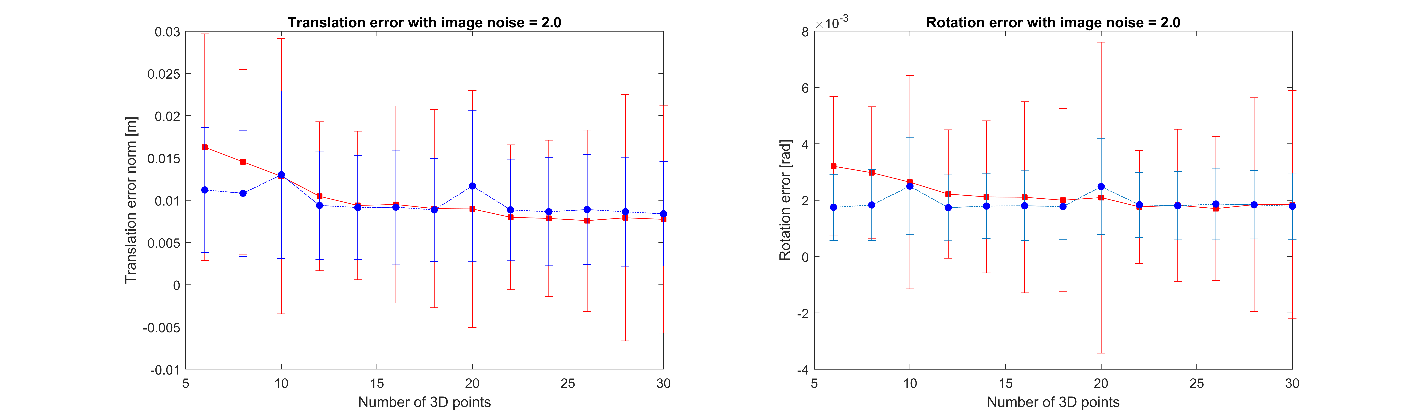
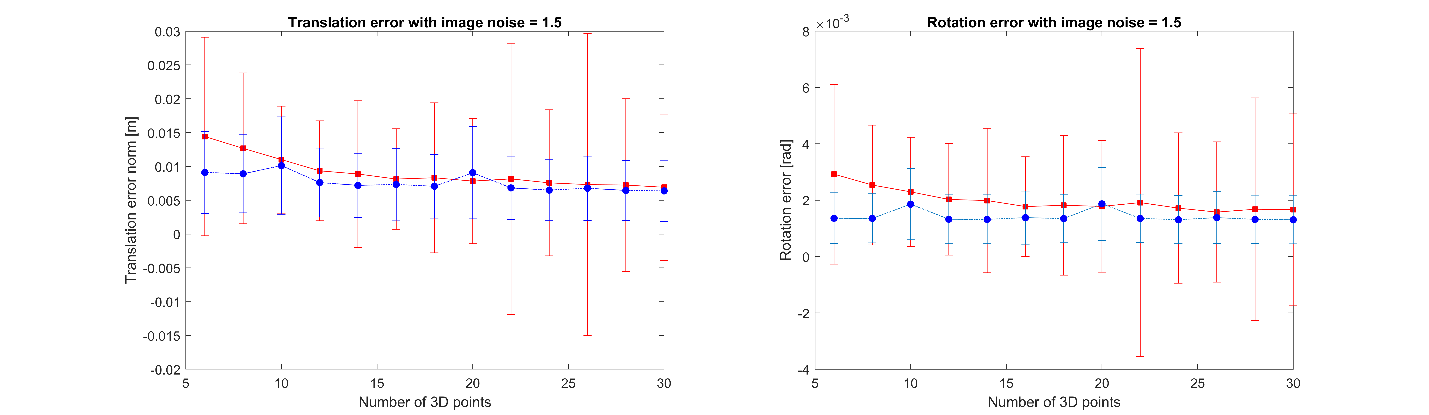
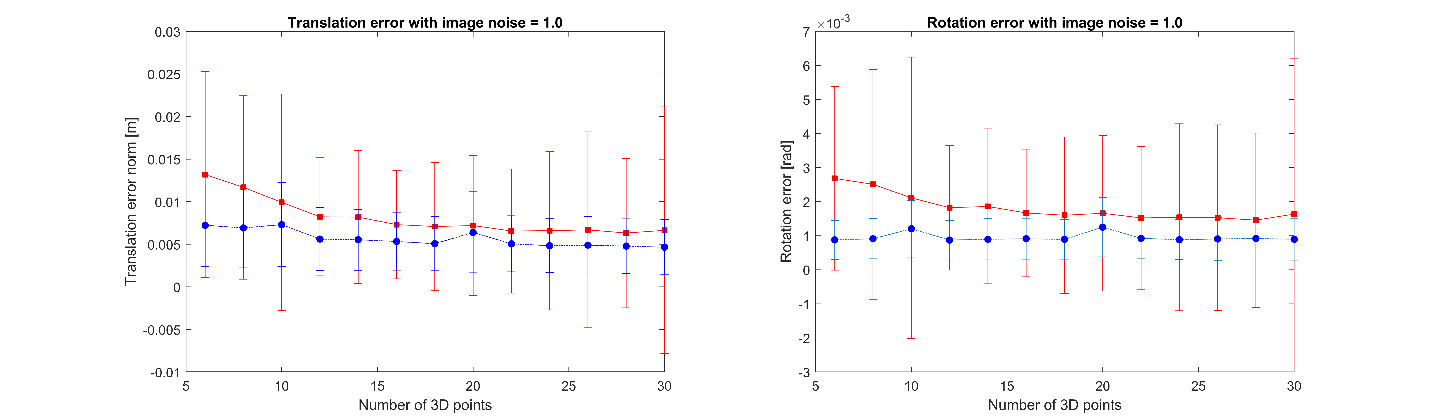
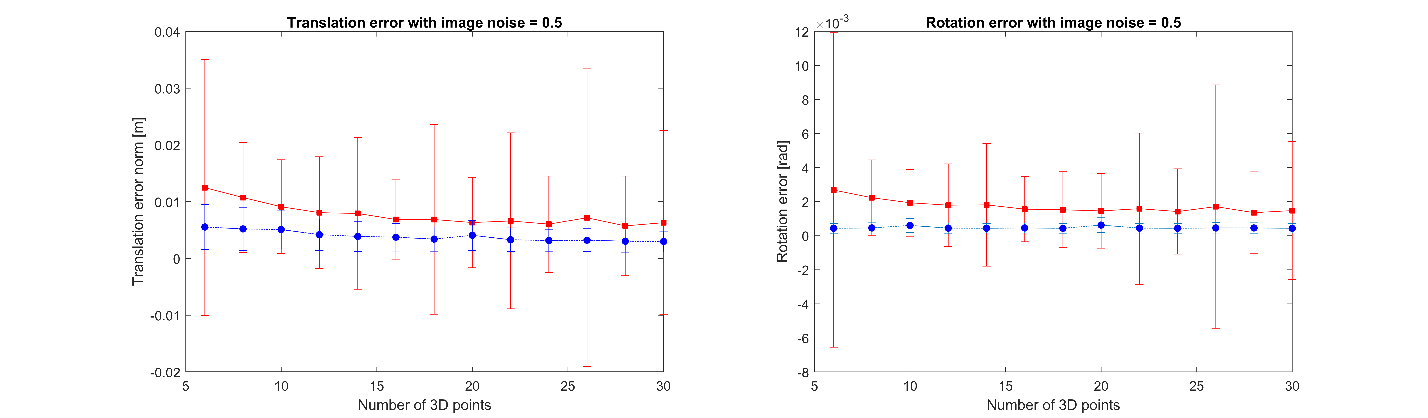


Then, I compare the new Hybrid-PnP (<https://github.com/rising-turtle/pnp_hybrid> ) with EPNP. First, with the same number of matched points (N), but with different image noise (), and it seems that the larger the image noise is, the worse the Hybrid-PnP is than that of EPnP. It is reasonable since large image noise will result in large rotation error for the 2D-2D part ( eigensolver), however, for small image noise, Hybrid-PnP can outperform EPNP by exploiting more 2D measurements.

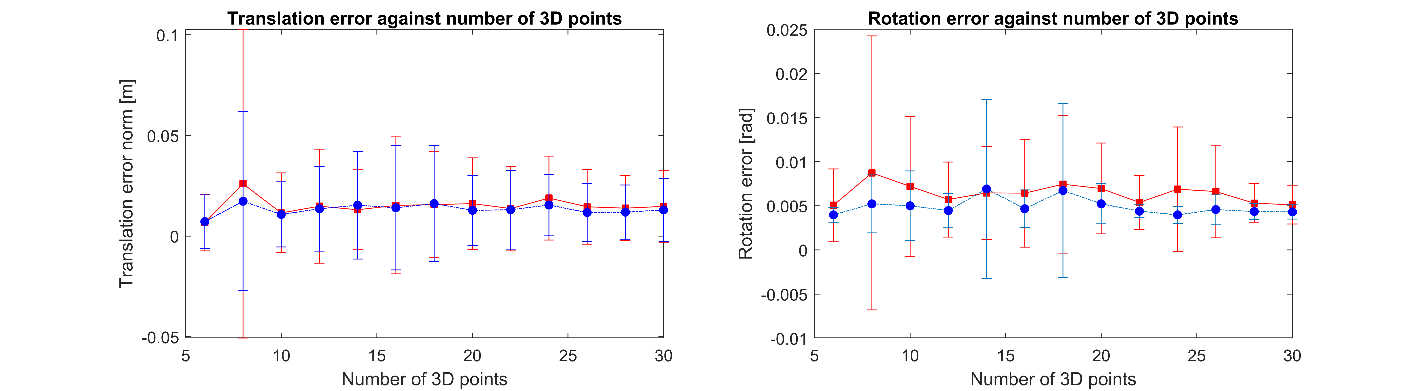
The results are shown below, which shows: 1) when N is 30, Hybrid-PnP is better than EPNP if ; 2) when N is 20, Hybrid-PnP is better than EPNP if 2; 3) when N is 20, Hybrid-PnP is better than EPNP if 0.



Second, with image noise (), I compare the accuracy against different number of 3D points (N). The results are shown below, which shows: 1) when , Hybrid-PnP is always better than EPNP 2) when , Hybrid-PnP is almost equal to EPNP.



I also run one comparison using the iphone’s data, rot-pitch 3 degree, and the result is almost consistent with the simulation results.



All these results have not involved any GN optimization, and I believe the results can be further improved with GN.