

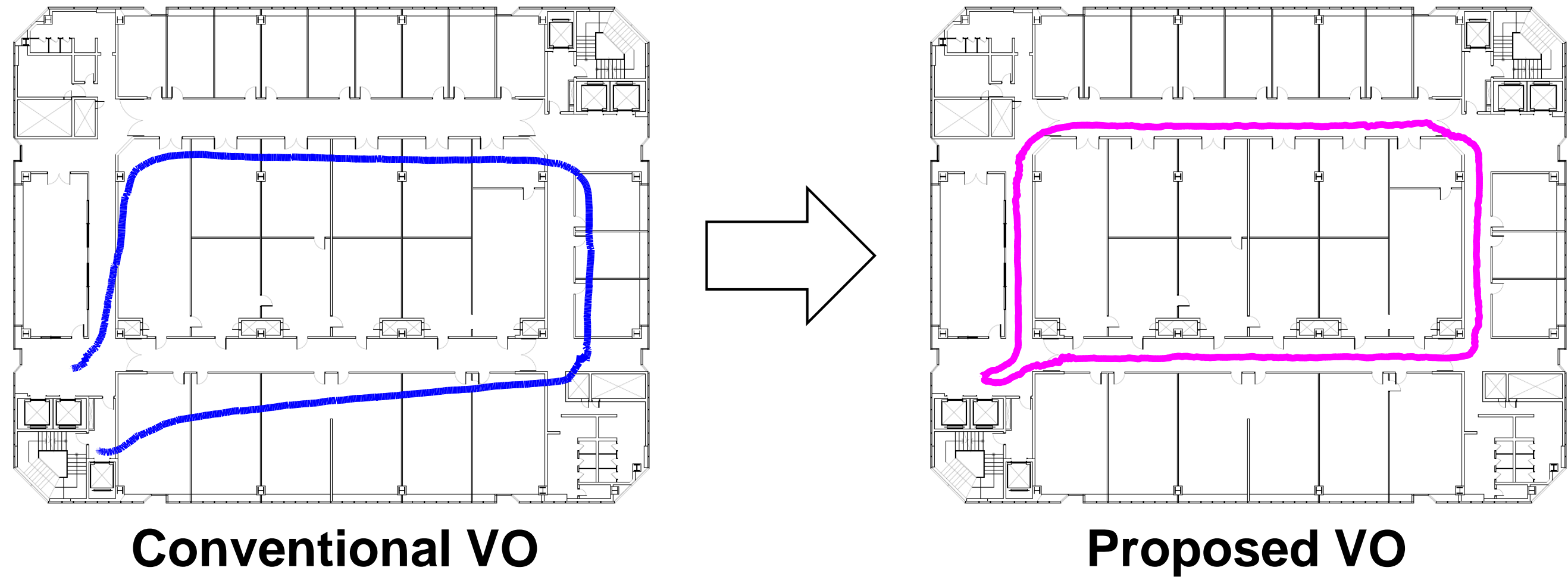
Low-Drift Visual Odometry in Structured Environments by Decoupling Rotational and Translational Motion



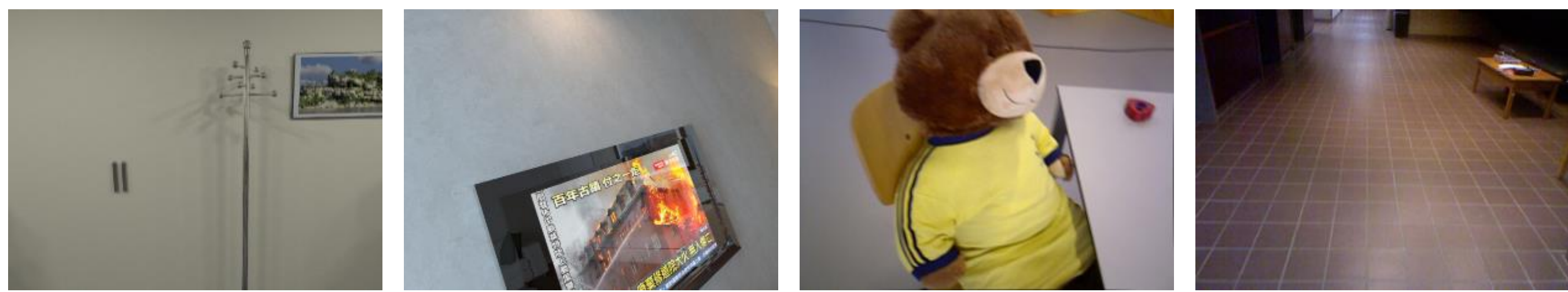
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Motivation



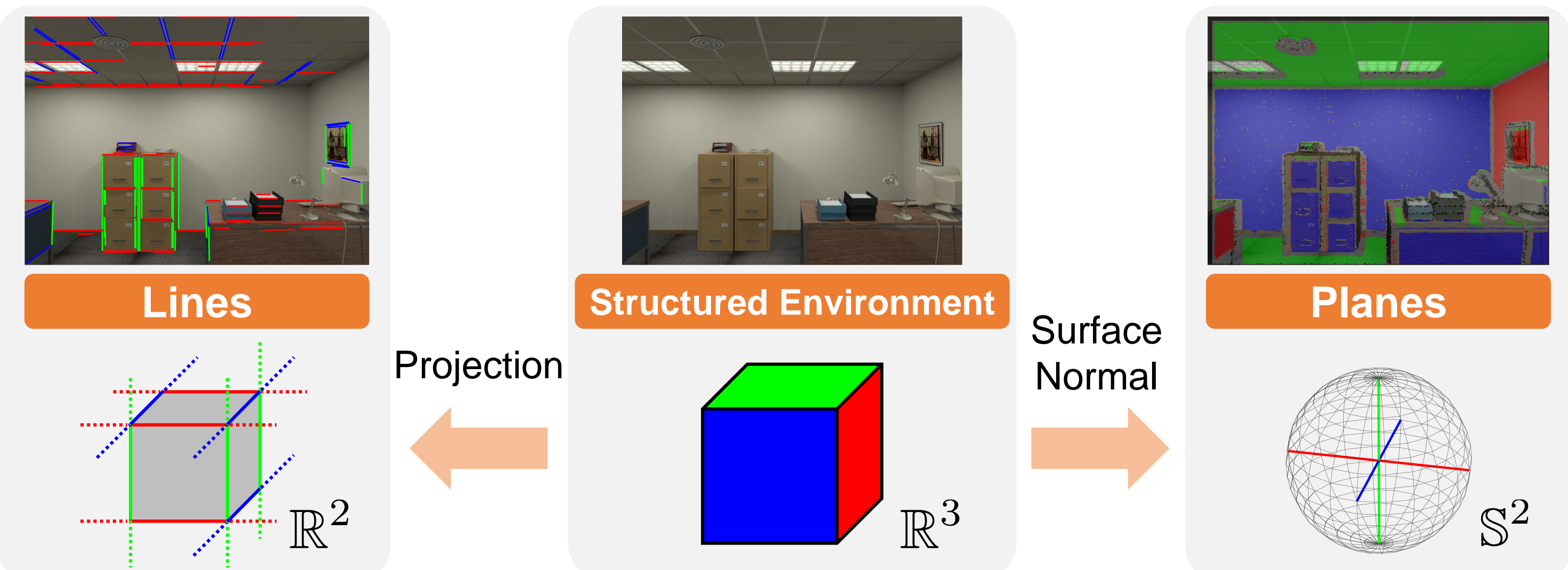
- The main source of positional inaccuracy in visual odometry (VO) is inaccurate rotation estimation.



- Existing rotation estimation approaches require at least two orthogonal planes to be visible at all times.

Solution

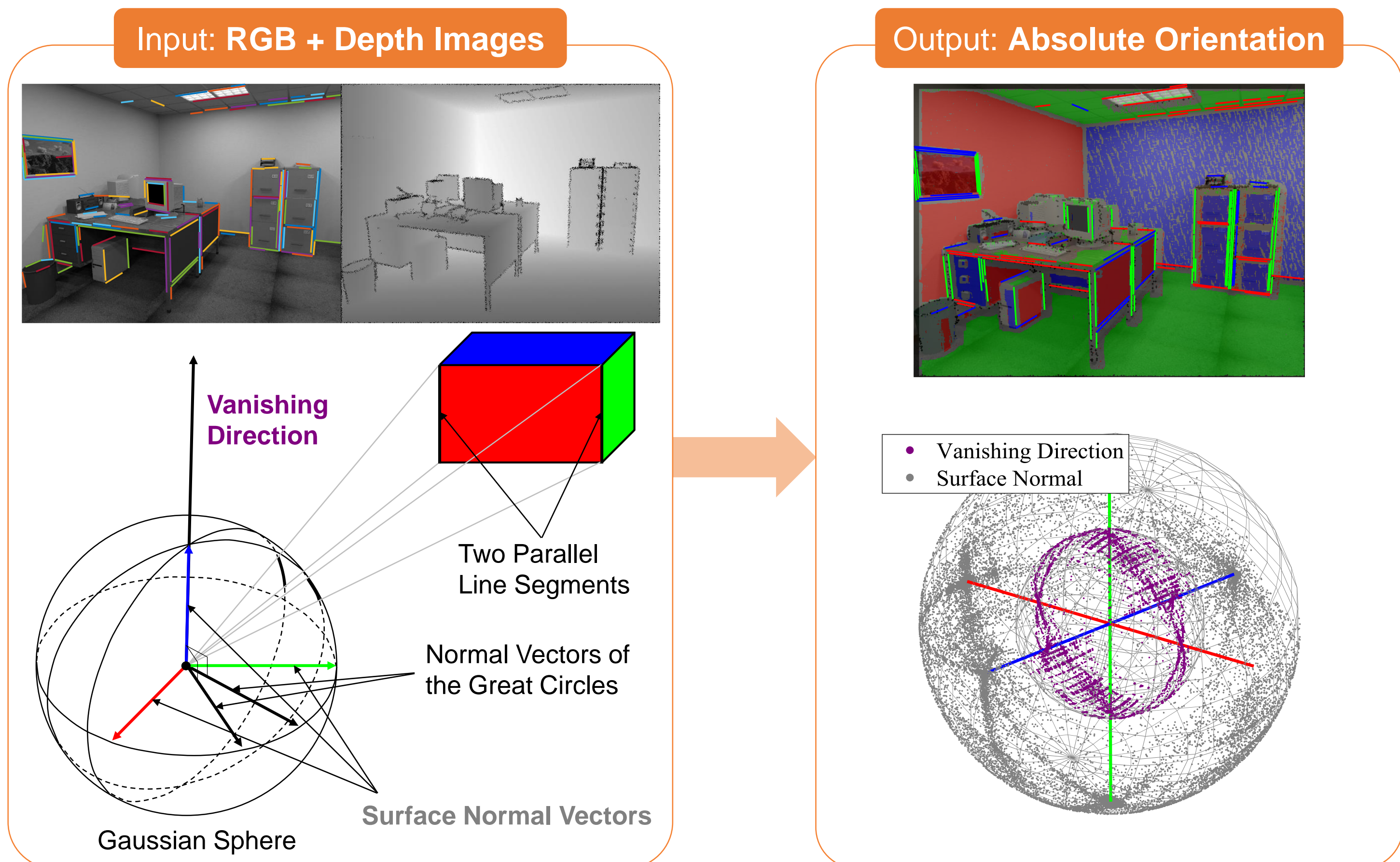
Drift-Free Rotation from Lines and Planes Together



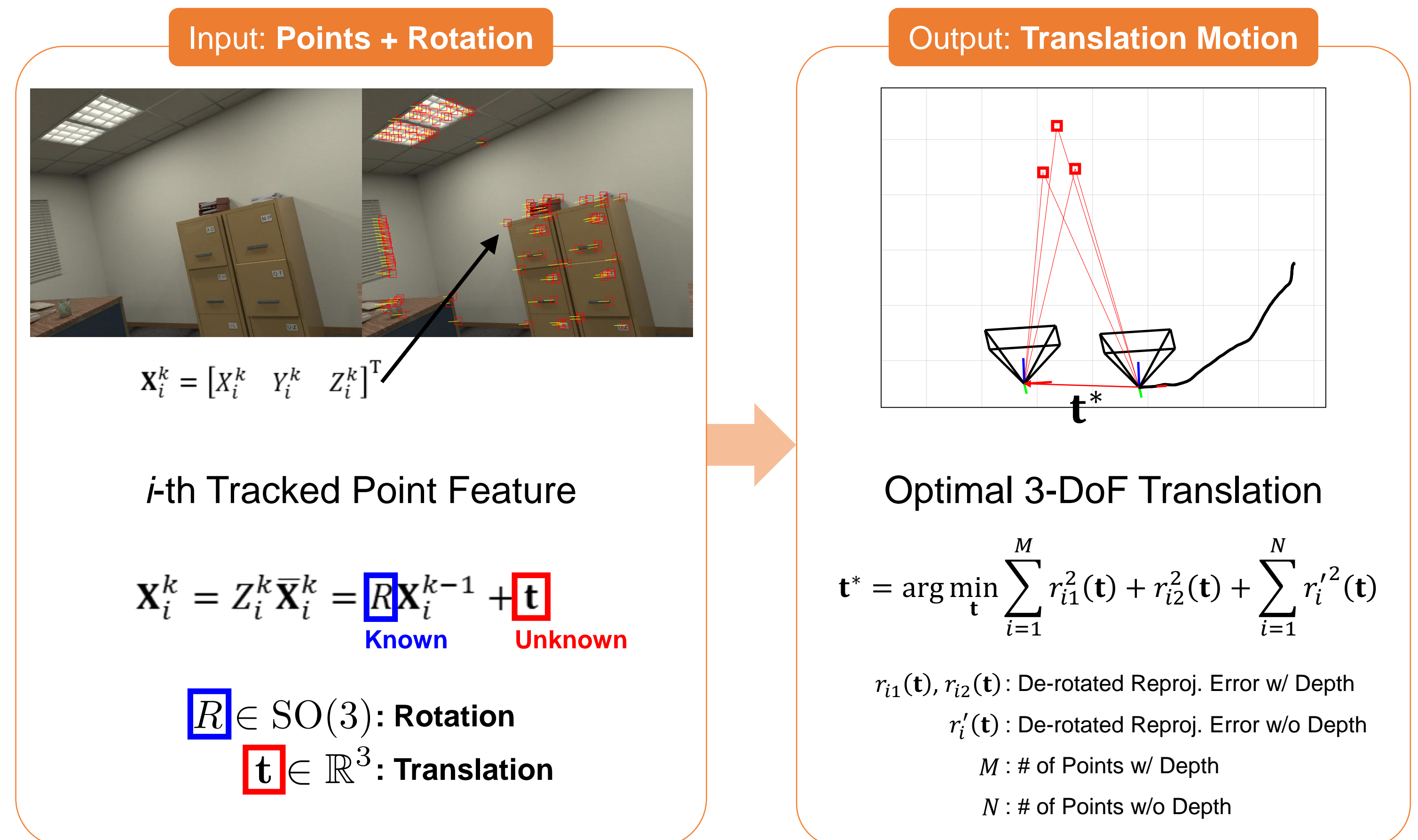
Contributions

- Drift-free rotation estimation jointly from lines and planes
- Translation estimation with de-rotated reprojection error
- Evaluation on various man-made environments

1. Drift-Free Rotation Estimation



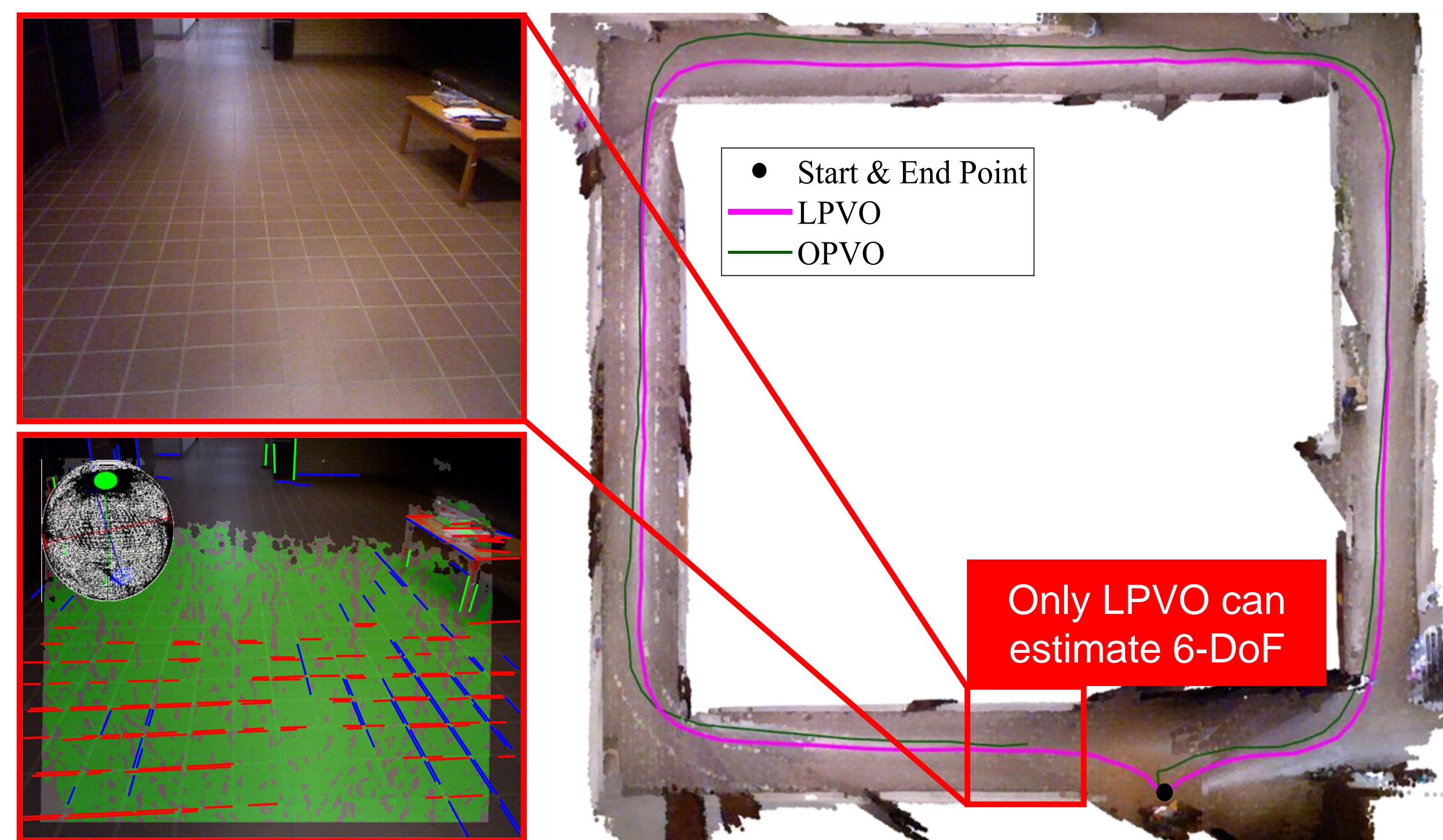
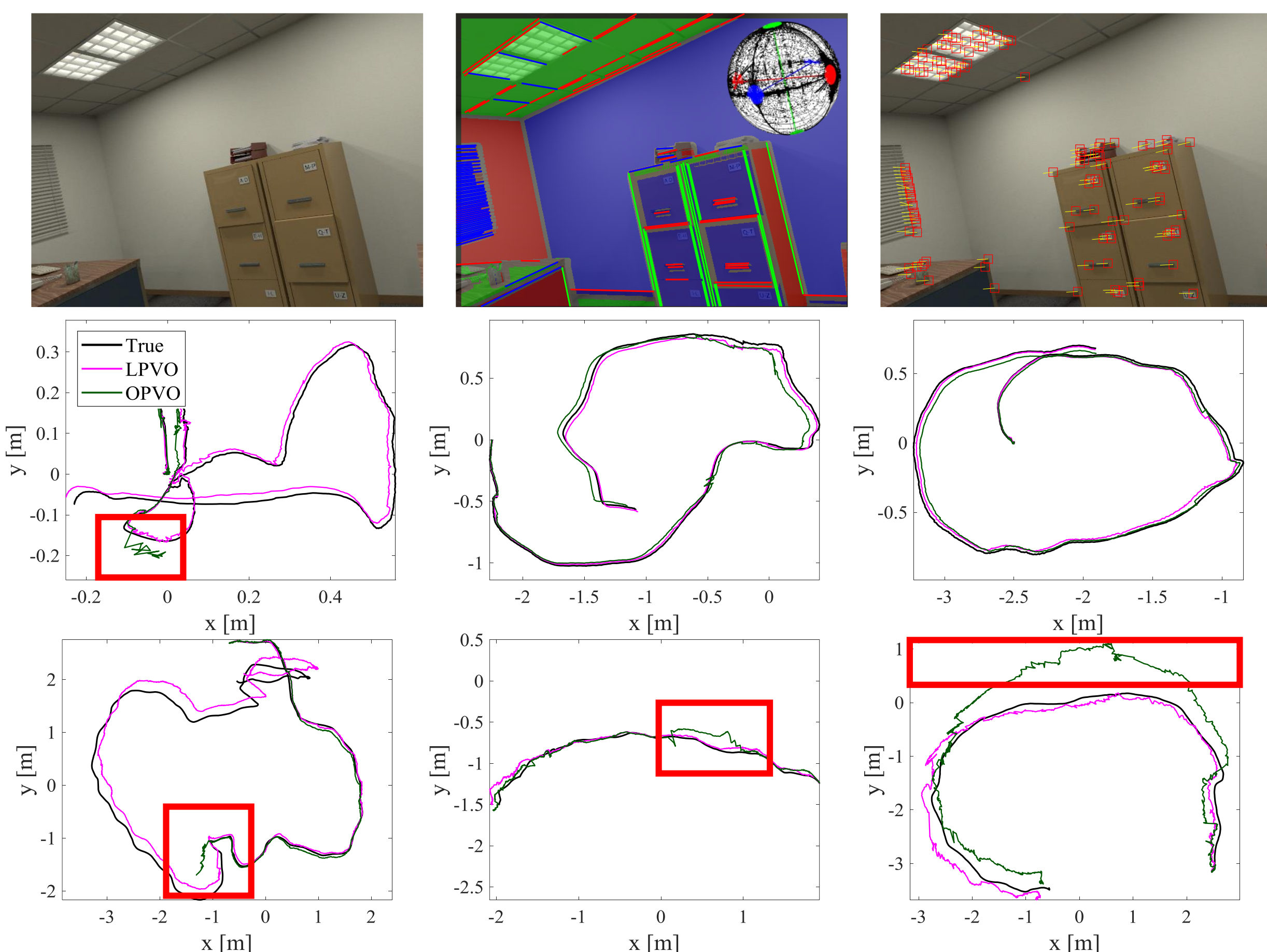
2. Translation Estimation



3. Evaluation

ICL-NUIM & TUM RGB-D Datasets (~10 m)

TAMU RGB-D Datasets (~100 m)



- Estimated and ground-truth trajectory overlap significantly.

- The starting and end points coincide at the same place.