tries to minimize errors over loops

Since keyframe-based monocular SLAM is an optimization problem, it is prone to drifts in camera pose estimates. The loop closure thread attempts to establish loops upon the insertion of a new keyframe, in order to correct and minimize any accumulated drift by the system over time using either PGO or BA; the implementations of such optimizations has been made easier using libraries such as G2o [46] and Ceres [50].

**LSD SLAM:** Once a keyframe is replaced as tracking reference – and hence its depth map will not be reﬁned further – it is incorporated into the global map by the map optimization component. To detect loop closures and scale-drift, a similarity transform ξ ∈ sim(3) to close-by existing keyframes (including its direct predecessor) is estimated using scale-aware, direct sim(3)-image alignment.