Movable objects in dynamic environments should not be treated as landmarks. We propose to improve the robustness of CNN-based pose regressor in dynamic environments through three steps:

1. Compute prior distribution for our proposed prior-guided dropout.
2. Train the pose regressor with a prior-guided dropout module and a composite self-attention model, so that the regressor ignores distracting information from foreground objects and focuses on essential landmarks in the background for robust localization.
3. Quantify the uncertainty of pose estimation from multiple hypotheses given by the proposed dropout method and feed the uncertainty measures into uncertainty-aware pose-graph optimization.

Foreground objects are different in training and test images, which introduces bias when learning a camera pose regressor and leads to unstable localization.

Introduction

Architecture

Prior Computation

Uncertainty

Experiments