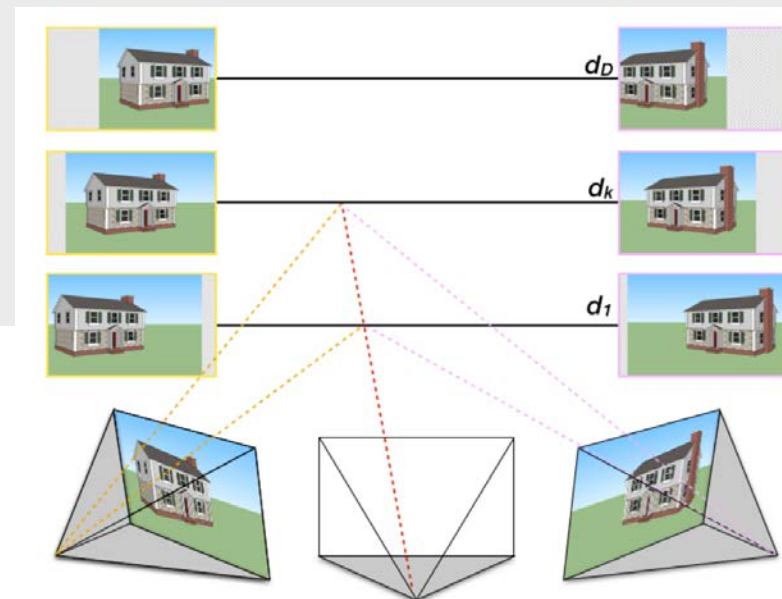


Wide Baseline Matching Using Novel View Synthesis

Goal: Solve the problem of large baseline matching using novel view synthesis from deep networks

Description:

Establishing feature correspondences between image pairs is an important task in image-based 3D reconstruction. Traditional approaches can robustly match between images with similar viewpoint but fail to robustly match wide baseline image pairs due to the increasing geometric and radiometric distortions. For example, this leads to disconnected 3D models around buildings, drift in SLAM, etc. Recent advancements in unsupervised deep learning lead to the development of variational methods that can synthesis novel viewpoints from existing images. This thesis aims to leverage existing deep neural network architectures for novel view synthesis for robust wide baseline matching. The basic idea is to generate a smooth sequence of images that can be used to track the motion of keypoints from one to the other images. In the first part, the project should use existing state-of-the-art deep networks and tracking algorithms to develop this method. In the second part, the method should be evaluated with respect to traditional wide baseline matching approaches in terms of matching performance.



[1] DeepStereo: Learning to Predict New Views from the World's Imagery, Flynn et al.

[2] Detection and Tracking of Point Features, Tomasi and Kanade

[3] Robust Wide Baseline Stereo from Maximally Stable Extremal Regions, Matas et al.

Requirements / Tools:

Required: Python, Matlab, Ability to execute/combine existing code

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