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Weekly Report
6/14 – 6/20

- Learned techniques and algorithms used in ORB_SLAM2 lib.
    - ORB features – FAST algorithm for feature detection; BRIEF algorithm for feature descriptor.
    - Bag of words – feature extraction
    - Bundle adjustment – optimizing projections of image and minimizing the reprojection error
    - Covisibility graph and essential graph – a keyframe shows as a node and an edge between two nodes if they share the same map points. Essential graph only contains the edges with high covisibility from covisibility graph.
- Learned the usage of each dependency of ORB_SLAM2.
    - Image processing (ORB feature, keypoints, etc.) -> OpenCV
    - Feature recognition -> DBoW2
    - Map optimization -> g2o
    - Visualization and interface -> Pangolin
- Made camera calibration with OpenCV.
    - Need a chessboard for calibration.
- Learned camera matrix and distortion coefficients in OpenCV.
    - Camera matrix = [fx, 0, cx, 0, fy, cy, 0, 0, 1]
    - Distortion coefficients = [k1, k2, p1, p2, k3]

Plans for next week:

- Use webcam calibration to run ORB_SLAM lib
- Keep studying ORB_SLAM