EE838 Assignment 7
Robust estimation: Automatic computation of H

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Detailed assignment explanation

1. Preliminary: study the lecture note about "Automatic computation of H"
2. Detailed implementation
   A. Objective: Compute homography between two images
      i. H1-ex1.png ↔ H1-ex2.png, H2-ex1.png ↔ H2-ex2.png
   B. Interest points: Compute interest points in each image
   C. Putative correspondences: Compute a set of interest point matches based on some similarity measure
   D. RANSAC robust estimation: Repeat for N samples
      i. Select 4 correspondences and compute H
      ii. Calculate the distance for each putative match
      iii. Compute the number of inliers consistent with H
   E. Optimal estimation: Re-estimate H from all inliers by minimizing ML cost function with Levenberg-Marquardt
   F. Guided matching: Determine more matches using prediction by computed H
3. In your report, answer the following questions.
   A. Describe the methods of each step (how and what you implemented)
   B. Visualize the results of each step (see the lecture note)
      i. Interest points
      ii. Correspondence
      iii. RANSAC results (Inlier / Outlier)
      iv. 2nd image transformed by best H obtained by 4 corner point pairs
      v. 2nd image transformed by best H calculated from all inliers
   C. Write the best H for each image pair in your report (H1, H2)
   D. (BONUS) Analyze the difference in results as each method changes (Interest points, similarity metric, RANSAC variants, etc..)

Submission guidelines

- On the top of your report, clarify your name, ID number, and the assignment title.
- Make your report as a single PDF file.
- Write your report in either Korean or English.
- Title your report as "A#_firstname_lastname.pdf", where '#' indicates the assignment number (e.g., **A7_Gildong_Hong.pdf**).
- If there are additional files for assignments, put them into a folder along with your report, and then compress into a zip file (e.g., **A7_ Gildong_Hong.zip).**
- Upload your report (or zip file) to the submission page of the KLMS.

What to submit for assignment 7

- A report that does not exceed 5 pages
  (Focus on analysis & discussion rather than method descriptions or code explanations)
- MATLAB code files or C++ code files
  (Detailed annotations are required)