NTUST course: Computer Vision and Applications (CI5336701, 2022 Spring)

Homework#3: Calculate "fundamental matrix" and Print estimation error

Date Due：2022. May. 9th, PM11:59 (~2 weeks)

Description
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1. Writing a program for calculating "fundamental matrix" from 2 images (L.jpg & R.jpg) and estimating "projection (distance) error" of all your points. (choose your tools, ex. C++/C, python, openCV, Matlab).

2. Please manually pick-up corresponding point sets by external software (ex. Photoshop, xnView), and import (or copy & paste) the coordinate values into your source code. You don't need to write user-interface programs for picking up coordinate. However, you need to select at least 8 point-sets in both images, and calculate "fundamental matrix **F**" by any method in lecture. You also can use equivalent functions in OpenCV. Note: make sure the **F** has only **rank-2**.
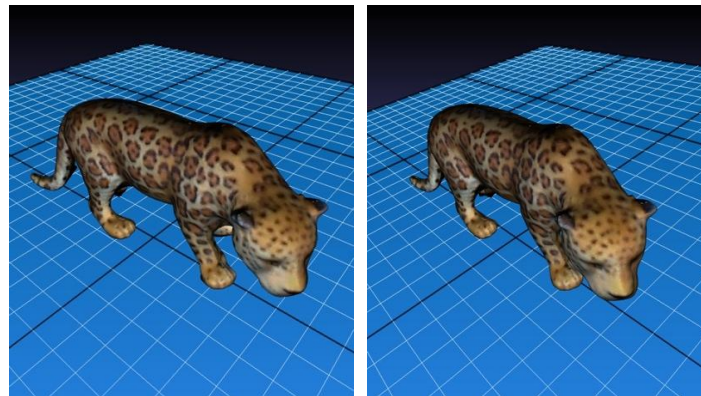
3. After you find out **F**, please generate "epipolar lines" and estimate "projection (distance) error" for every point. For example: generate "epipolar lines" (ex. **Fx** in right image), and calculate the "distance" between the estimated epipolar line and its corresponding point.

4. Please Print Out "**F**" and "distance value" (point to epipolar line) in your program.

5. Deliverable:

    1) Source code in either python or C/C++, Matlab, etc. with simple comment.

    2) Optional: Execution file (.exe) if applicable.

    3) Screen shot (in ID.jpg or ID.png) of your result (list for "**F**" and "error").

    Please zip all your files, and upload to moodle by date due.

Hint:

I will provide Golden Answer (without error) for you, however, your result should have calculation (as well as measurement) error.
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