

CS 91R: The Computational Image

Assignment 6: Image Stitching I

DUE March 26th at 11:59 PM

In this lab, we will stitch together multiple images using geometric transformations and forward and backward warping. This will be a two part-lab, with both due after spring break.

1 Tasks

1. [insert] Using `perspective_4point_transform` or `homography2d` from [jsfeat](#), use forward warping to draw webcam images on different quadrangles on a background image.



Figure 1: insert

2. [extract] Using `perspective_4point_transform` or `homography2d` from [jsfeat](#), use forward warping to draw only a part of the webcam image, essentially **rectifying** that part of the image.

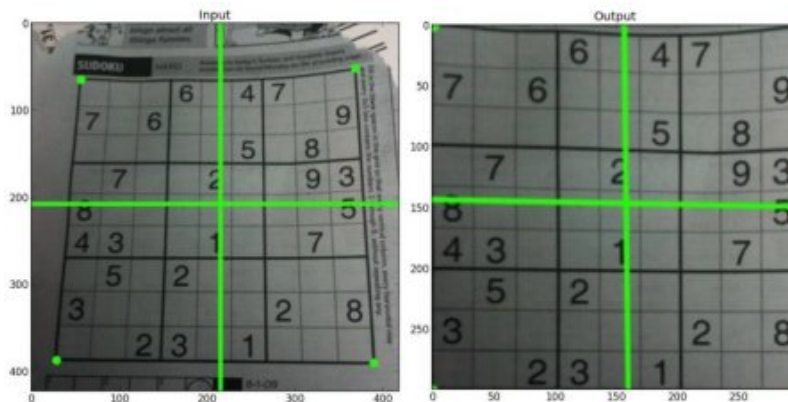


Figure 2: extract

3. Use [OpenCV's](#) `getPerspectiveTransform` and `warpPerspective` to accomplish the two previous tasks (insert & extract).

- NOTES: The tutorial has a bug, use: `let dsize = new cv.Size(src.cols, src.rows);` And, more on [OpenCV's Mat](#) in JavaScript.

2 Final Sketch

Combine your work into a single sketch:

- 'i': insert the webcam image into a static image using `jsfeat`
- 'e': extract a piece of the webcam image and rectify it using `jsfeat`
- 'j': insert the webcam image into a static image using `opencv`
- 'f': extract a piece of the webcam image and rectify it using `opencv`

Write in the `reflection.md` about how your `opencv` & `jsfeat` approaches compare.

3 Challenge Problems

1. Insert a static image into the live webcam image.
2. Stitch together multiple images (different views of a planar surface or rotating from a single point).
3. Automatically find the target quadrangle(s).

4 Learning Objectives

- use homographies to apply arbitrary 2D-geometry transformations
- compare forward and backward warping
- estimate geometric transformations from examples
- use `jsfeat` for some linear-algebra tasks
- use `opencv` for some computer vision tasks

5 Deliverables

1. Commit the JavaScript `sketch.js` to the repo.
2. Write the reflection (as a markdown document named `reflection.md`) about what you were able to accomplish in this lab. Don't forget the collaboration statement!