ECEn 631 Object Detection

Objectives:

- Learn to use feature descriptors and matcher in OpenCV.
- Learn to detect an object from live video input.

Instructions:

- Use OpenCV to complete this exam.
- Include your video link and discussion (how you do it and what you observe in one PDF file.
- Submit your PDF file and source code file(s) in one zip file without the folder or directory.
- Use your first name and last name (e.g., justinsmith.zip) as the file name.
- Login to myBYU and submit your work through BYU Learning Suite online submission.

Task 1: Feature Matching 40 points

- Select your preferable feature descriptor (SIFT, SURF, rBRIEF, or ORB) that is able to handle rotation and scaling variations well.
- Select a rectangular object such as a book, cereal box, puzzle or game box, preferably with rich features.
- Take a good picture of this object and save it as the reference image.
- Take another picture of the same object but from a different perspective and distance.
- Use OpenCV functions to detect features in both pictures.
- Place the two pictures side by side and use OpenCV functions to draw the matching features like the image shown below.

- Include your result and a brief discussion in the PDF file.
- Include your code.

Task 2: Live demo of object detection 60 points

- Place your select object together with other similar objects (books and boxes, etc.) as shown in Task 1.
- Point your camera to these mixed of objects and draw a green rectangle around the select object in real time.
- Move your camera around and change camera distance to the objects.
- Partially cover and uncover your select object.
- Record a video of the above experiments.
- Submit your video link and a brief discussion in the PDF file.
- Include your code.