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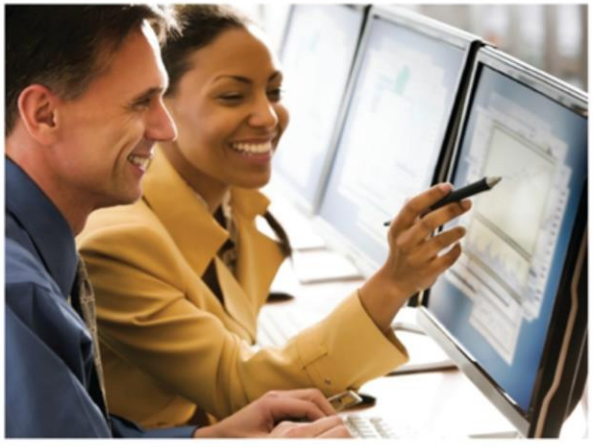
# Exercises: Line Detection

AUVSI Foundation: Computer Vision Training



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# Lane Detection

Perform line detection on a highway image.

1. Open the script `laneDetection_start` and run it to see the sample frame. Fill in code according to the comments in the starter code. The following points help in implementing the rest of the code.

2. Threshold the image to create a binary mask of the lines. Use the provided utility function `createLaneMask`.

3. Skeletonize lines to make thin lines using `bwmorph`.

4. Perform a Hough transform on the binary mask to obtain a Hough matrix using `hough`.

5. Identify the peaks in the Hough matrix using `houghpeaks`. Manage sensitivity using `Threshold` and `NHoodSize` properties to obtain enough sensitivity while removing overlapping lines.

6. Extract lines from the binary mask using `houghlines` function. Handle dashed vs. solid lines using `FillGap` and `MinLength` properties to manage the extracted line lengths.

7. Get points for visualization using the provided utility function `getVizPosArray`.

8. Visualize the lines on the original image using the `insertShape` and `insertObjectAnnotation` functions.

9. Test the code for the video '`laneDeparture.avi`'. Use `vision.VideoFileReader` and `vision.DeployableVideoPlayer`.

**Solution**

Solution for lane detection with a single frame

```
>> laneDetection_frame
```

Solution for lane detection with a video

```
>> laneDetection_vid
```