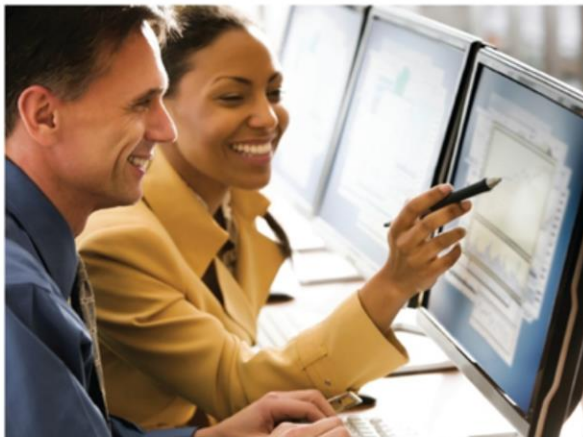


Exercises: Point Clouds

AUVSI Foundation: Computer Vision Training



Ground Plane Extraction

Use a point cloud to isolate points corresponding to the ground plane.

1. Open the starter script `groundPlaneExtraction_start`. Fill in code according to the comments in the starter code. The following points help in implementing the rest of the code.
2. Load the point cloud from the file `ptCloudCar.mat` and view it.
3. Fit a horizontal plane to the point cloud using `pcfitplane`. View the extracted point cloud.
4. Extract the color data from the point cloud object.
5. Create a binary mask using the inlier indices such that ground points are true.
6. Use this binary mask to set pixels of the color data to zero if they are not part of the ground plane.

Solution

Solution for ground plane extraction

```
>> groundPlaneExtraction
```

Solution for Extra

```
>> groundPlaneLineDetection
```

Extra:

Often when extracting white lines for lane detection, white vehicles, sidewalks and other objects in the environment can negatively affect the results of the Hough line detection algorithm.

Extracting the ground plane can allow the user to narrow Hough line detection to only the pixels that correspond to the ground. Using the extracted plane:

1. Obtain a binary mask of thin lines.
2. Apply hough transform to extract lines using the `hough`, `houghpeaks`, and `houghlines` functions.
3. Remove the horizontal lines.

