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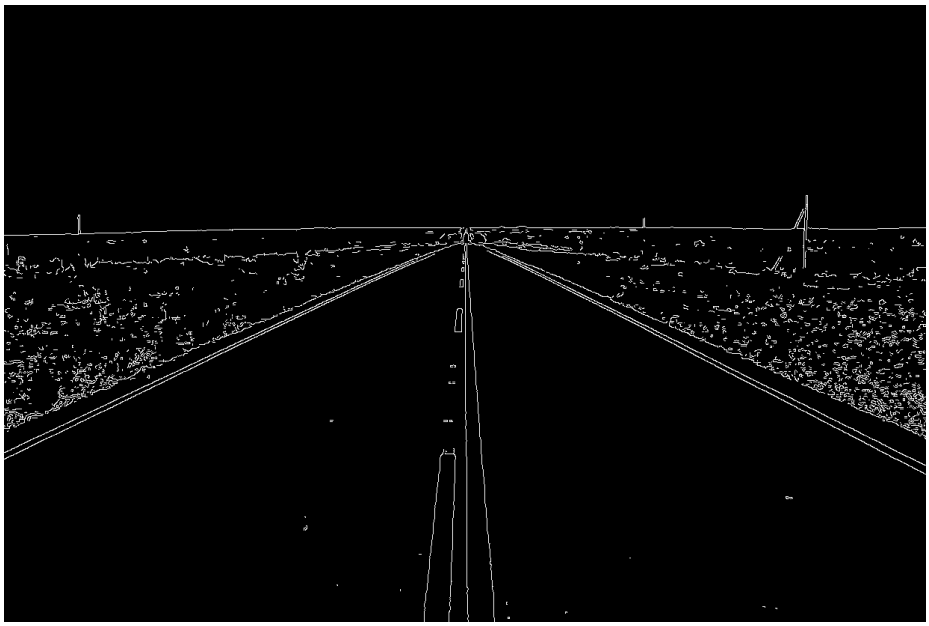
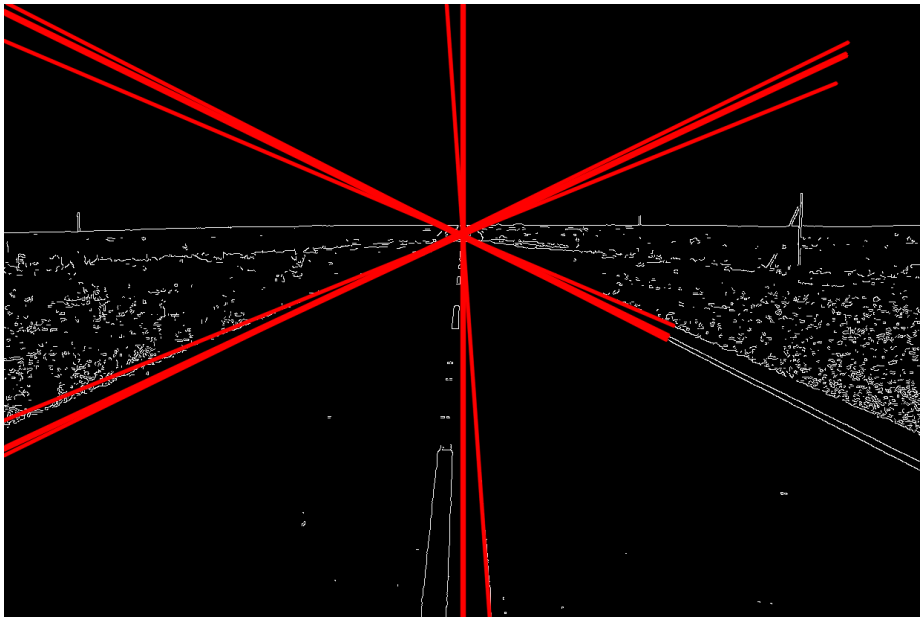
Week 8 report

Finding the Canny edges



Employ the Hough Transform method to detect lines.



Locate the image point (*u*, *v*) that represents the vanishing point by forming the equations of lines in polar coordinates and form the matrix [At = b]. Then solve for *t* using the least square solution of the provided equation below:

For solving for t I have implemented two approaches in the first one I have used Singular Value decomposition to solve the system of linear equations.

```
U, S, Vt = np.linalg.svd(A, full_matrices=False)
V = Vt.T
t = V @ np.linalg.inv(np.diag(S)) @ U.T @ B

u, v = t
```

In the first line i use SVD for decompose the matrix A and then we obtain the U, S, V matrices further I use the formula to obtain the t.

```
t=np.linalg.inv(A.T@A)@A.T@B # Implementing the formulae
u, v = t
```

In the second approach i directly use the formula to solve for the t.

Visually mark the (*u*, *v*) position with a distinctive red circle on the image plane.