Color Image Analysis On Off-road Object Identification
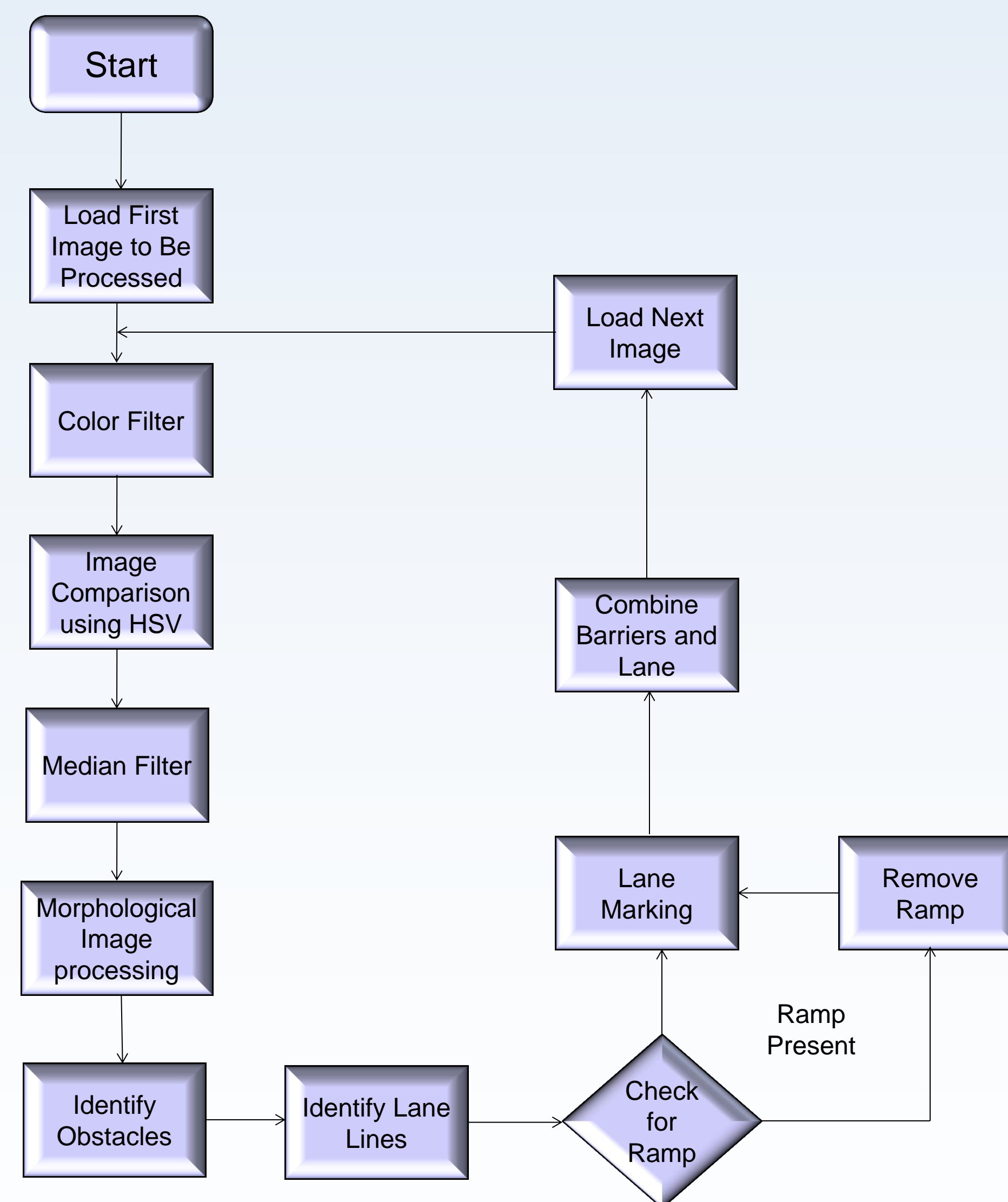
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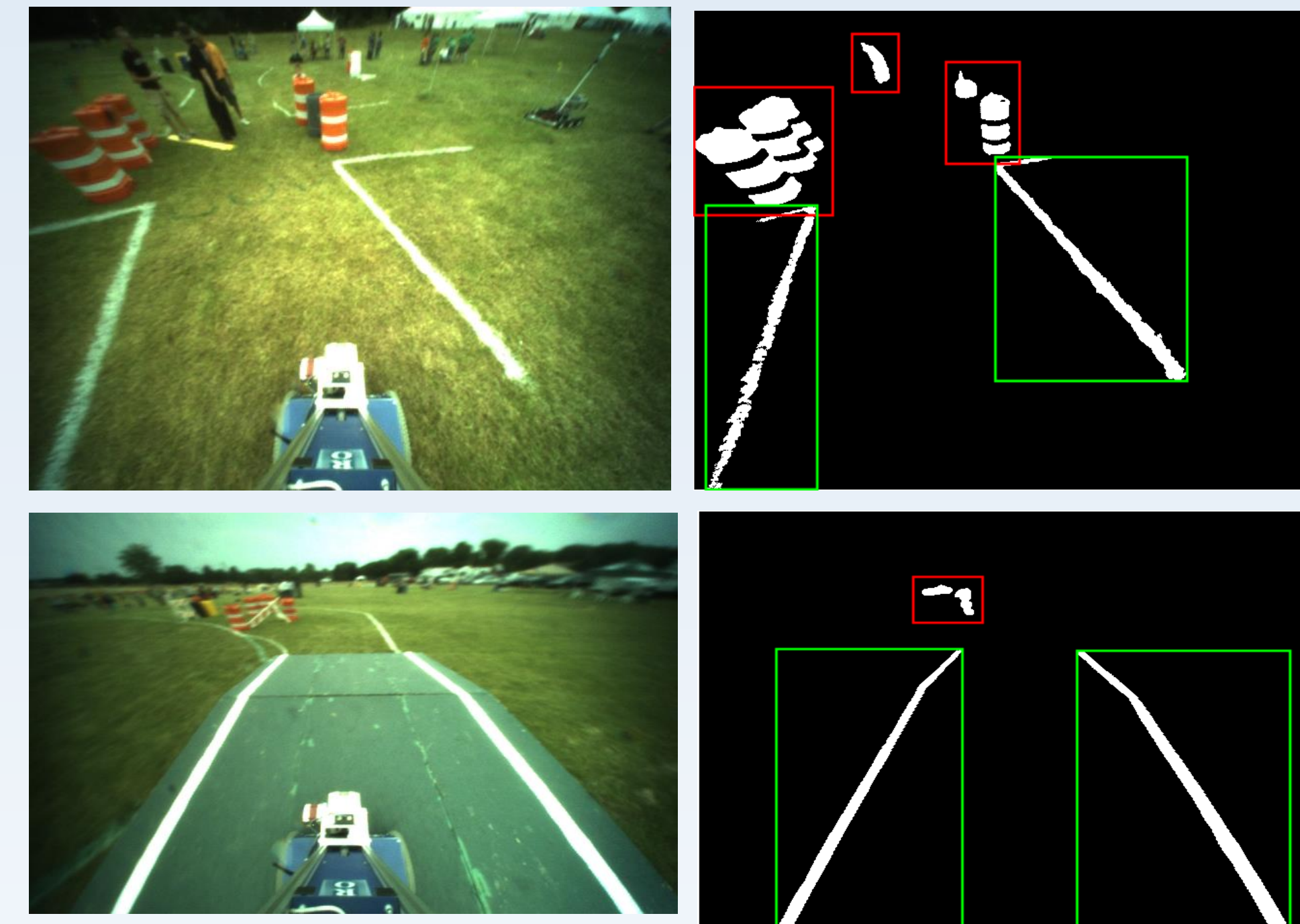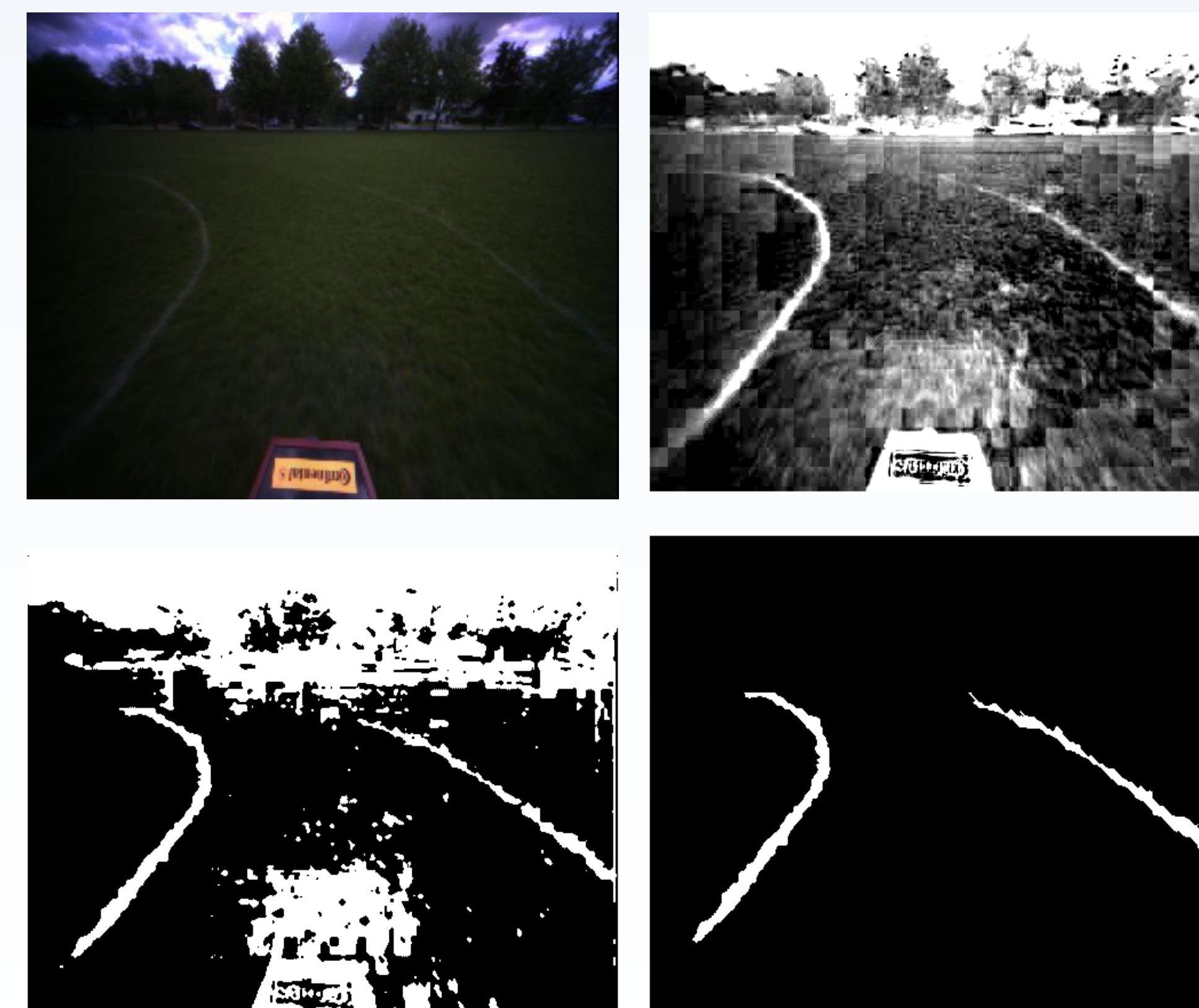*Professor: Dr. Mark Paulik*

DIP Concept

- ❑ Breaking a complex problem into smaller portion makes finding a solution easier.
- ❑ Each subtask has its own solution that can then be brought together to reach an overall solution.

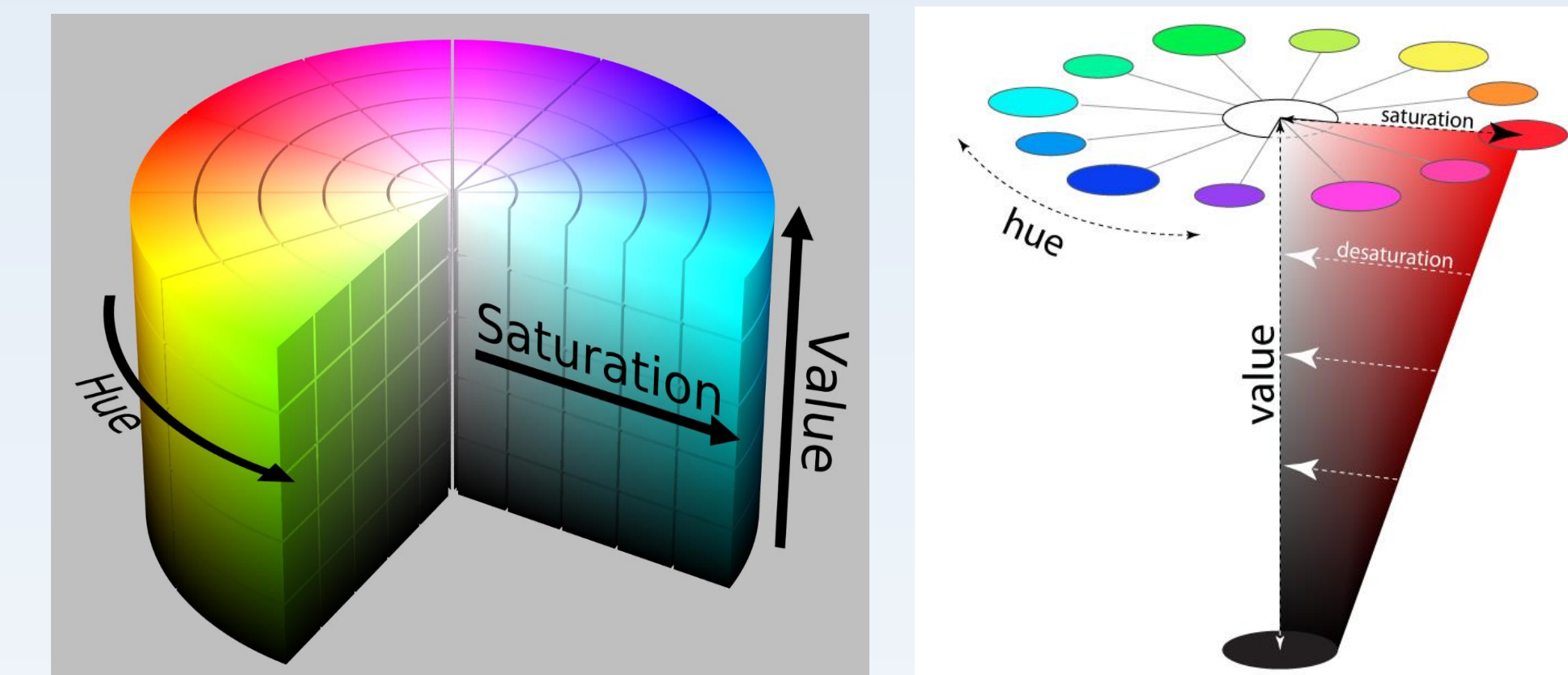## Trial Course Lane detection



Dark Image Lane detection

Hue-Saturation-Value (HSV)

- ❑ Similar to the RGB planes, the HSV representation can be used to describe an image using the hue & saturation values instead of pixel intensity values from the RGB planes


Morphological processing

- ❑ Morphology is a broad set of image processing operations that process images based on shapes. Morphological operations apply a structuring element to an input image, creating an output image of the same size.
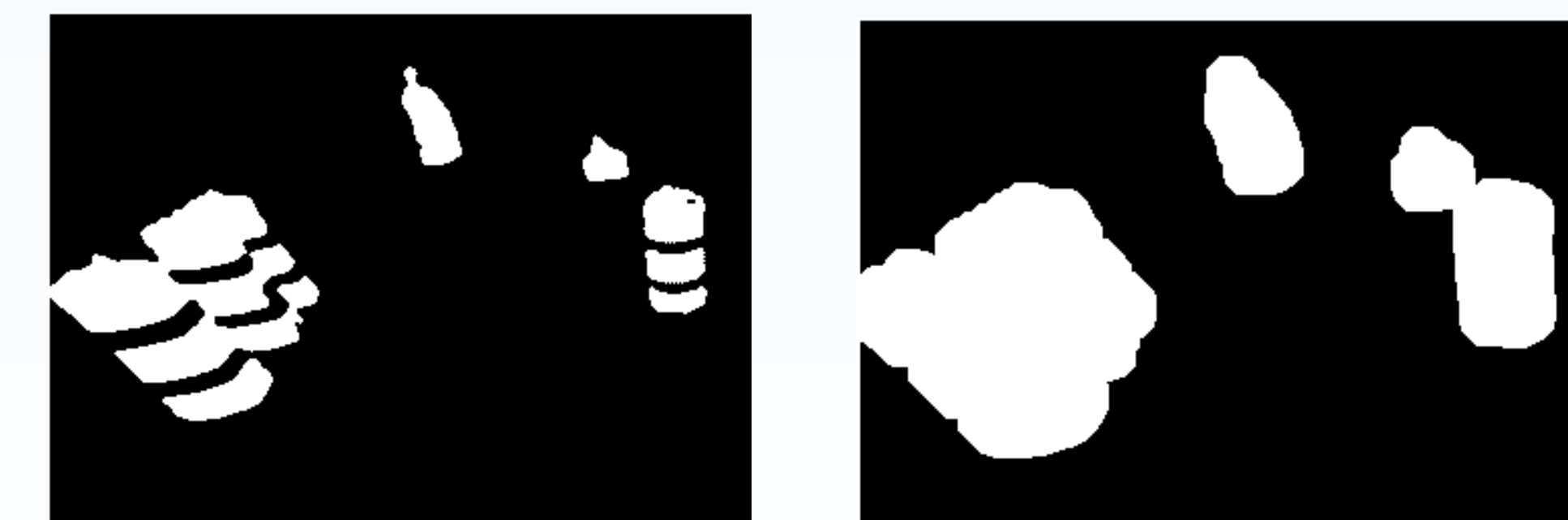
- ❑ In the Images above we dilate the image using a disc of 10 pixels. It is visible in the Images we used dilation to combine the obstacles so that we could group them into 1 obstacle where the obstacles are closer to each other.

Localization

- ❑ Localizing obstacles and lines will aid in navigation
- ❑ The lanes/ obstacles are detected and plotted in the Cartesian coordinates as seen in images below.
- ❑ Morphological Operations allow for similar obstacles to be set to certain shapes for easier identification
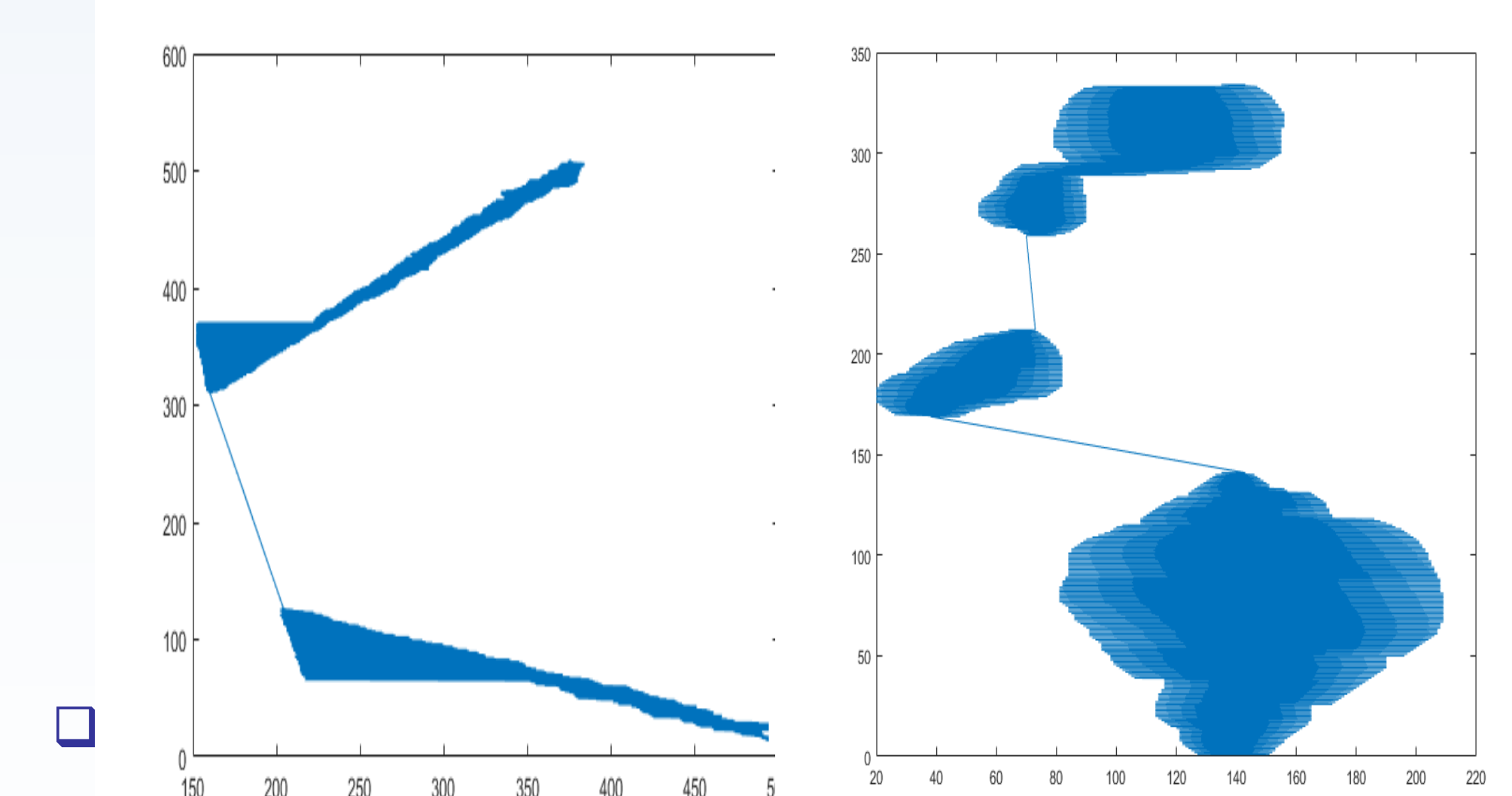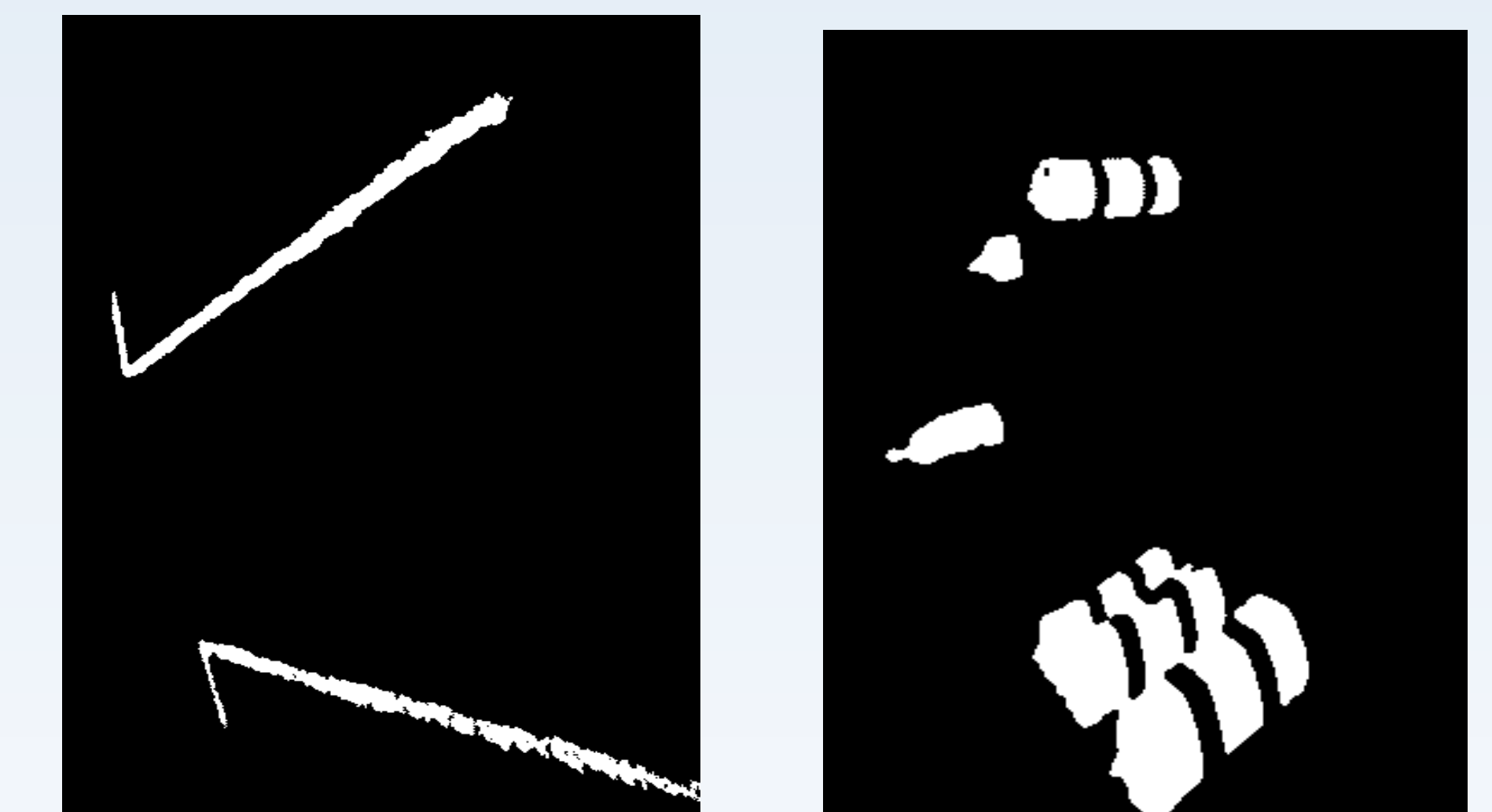
- ❑ Localized Lane Lines and Obstacles