Project: Use Imaging to Detect and Count Stainless Steel Flatware in a Tray

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CS 585 – Computer

Beginning image: Stainless steel flatware. It is the same color as the background and has very little texture.



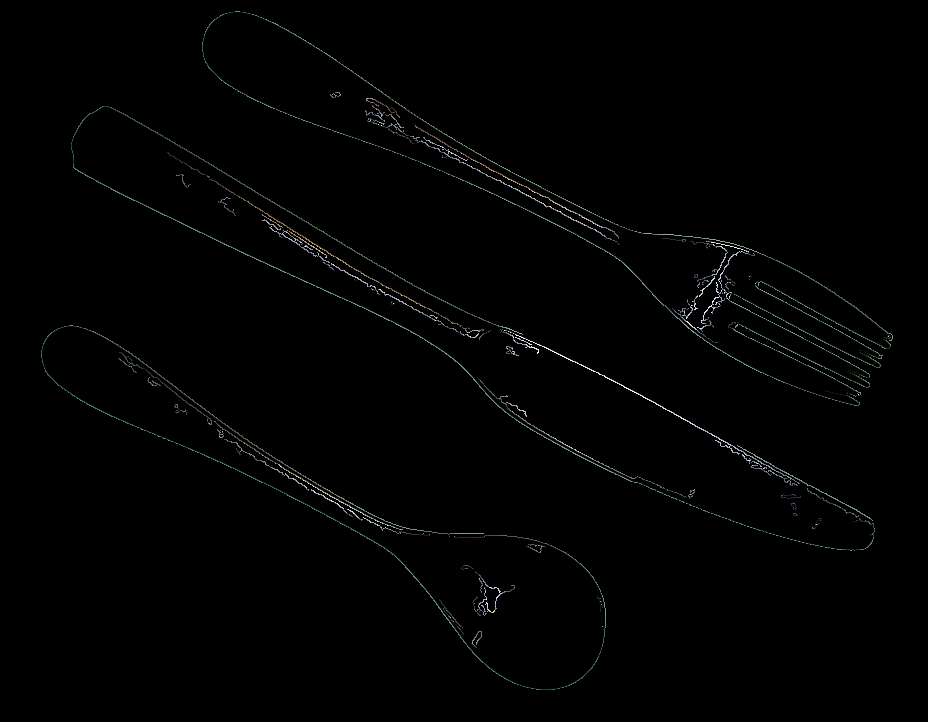
silverware stainless bg.png

Apply Canny filter using OpenCV:



reflective\_bg.png

Compare this image which has many false edges due to reflections to an image taken against a lime green paper background. Notice fewer reflections and better edges:



canny\_nonreflective\_bg.png

Segmentation Methods under consideration

The color-based segmentation shown in Figure 5.16 only looks at pixel colors when determining

the best clustering. It may therefore cluster together small isolated pixels that happen

to have the same color, which may not correspond to a semantically meaningful segmentation

of the image.

Better results can usually be obtained by clustering in the joint domain of color and location.

In this approach, the spatial coordinates of the image xs = (x; y) , which are called

the spatial domain , are concatenated with the color values xr , which are known as the range

domain , and mean-shift clustering is applied in this five-dimensional space xj . Since location

and color may have different scales, the kernels are adjusted accordingly, i.e., we use a kernel

of the form

K(xj) = k

\_

kxrk2

h2

r

\_

k

\_

kxsk2

h2

s

\_

;

Figure 5.22 Comparative segmentation results (Alpert, Galun, Basri et al. 2007) c 2007

IEEE. “Our method” refers to the probabilistic bottom-up merging algorithm developed by

Alpert et al.

Decided to use frame subtraction initiation. Will also use calibration.

MOG Background subtraction didn’t work well except for shadows:

Image input size 3872 x 2592