

# Fast Demo of UNO Research

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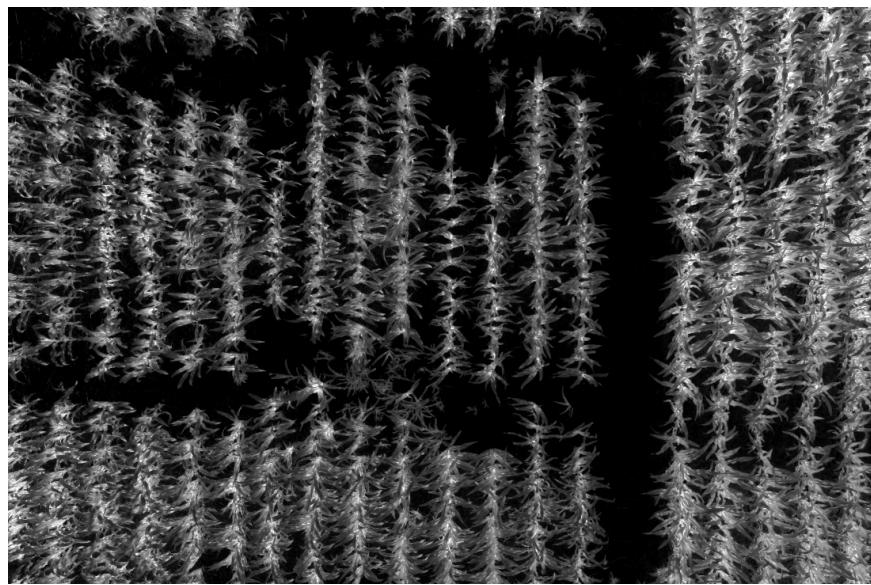
2/17/2020

```
## For complete code go to https://github.com/niconaut/CropDetectR
```

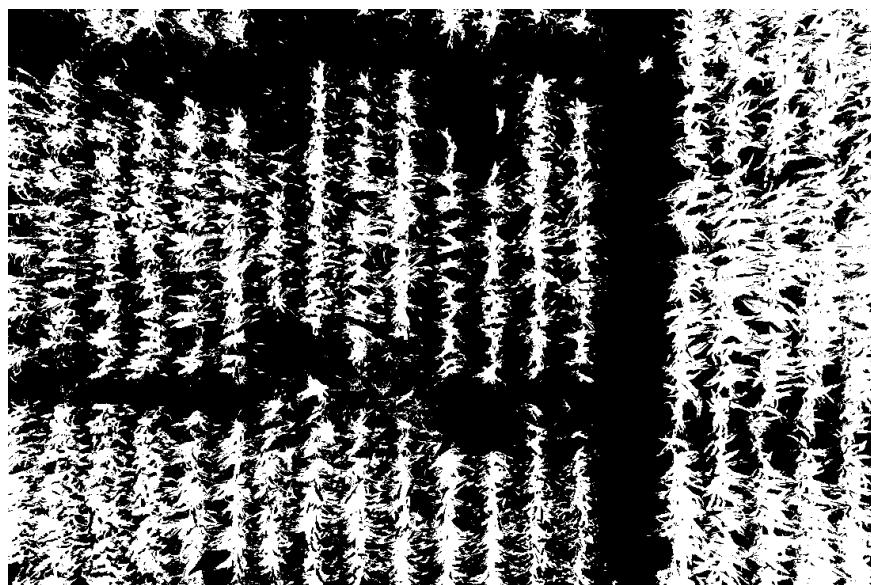
```
## Beginning Image
```



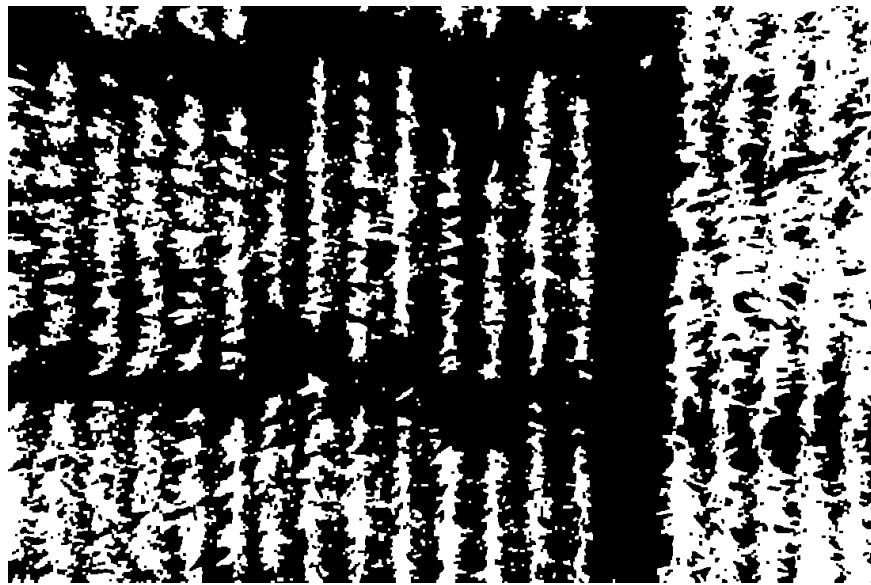
```
## Excess Green Index to convert from color image to single-channel grayscale image
```



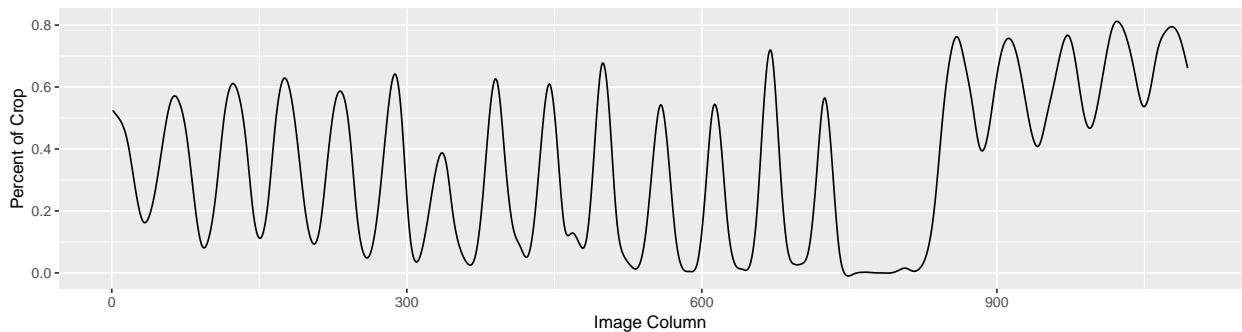
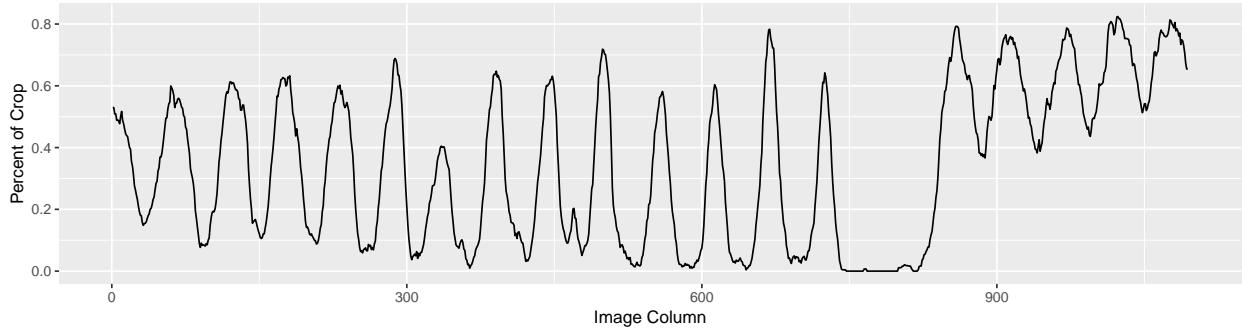
```
## Otsu Thresholding to make the grayscale image binary.
```



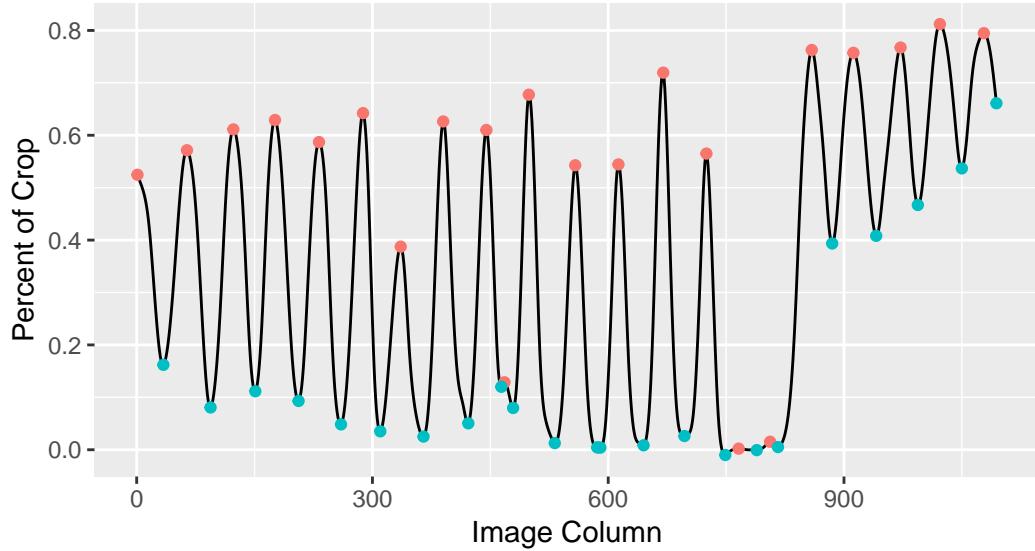
```
## Morphology to modify Otsu image for a clean view of crop rows. Having the image  
## be as simple and clean as possible will help with row identification.
```



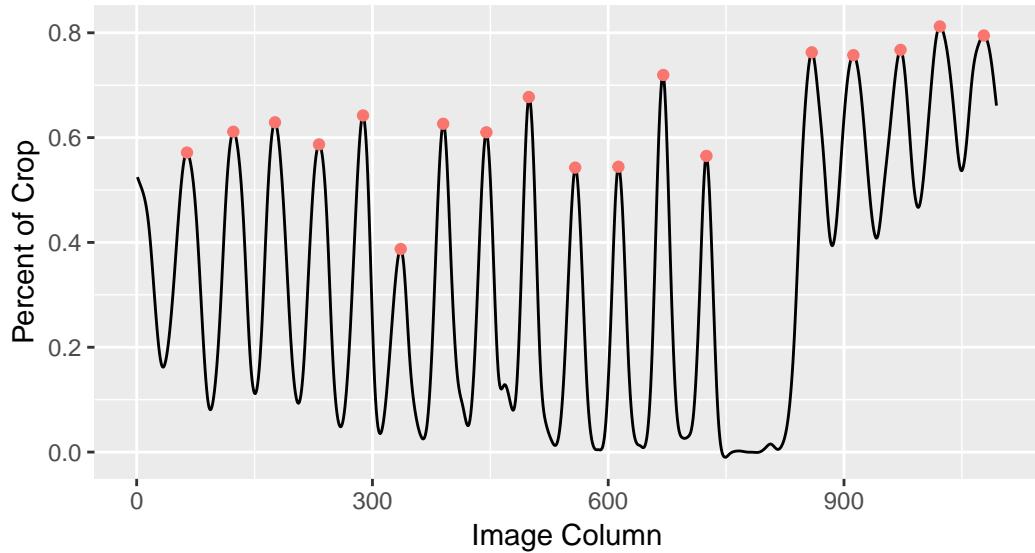
```
## Viewing the image as a line makes it obvious to where the crop  
## centers are, smoothing the line will help identify crop centers and gaps.
```



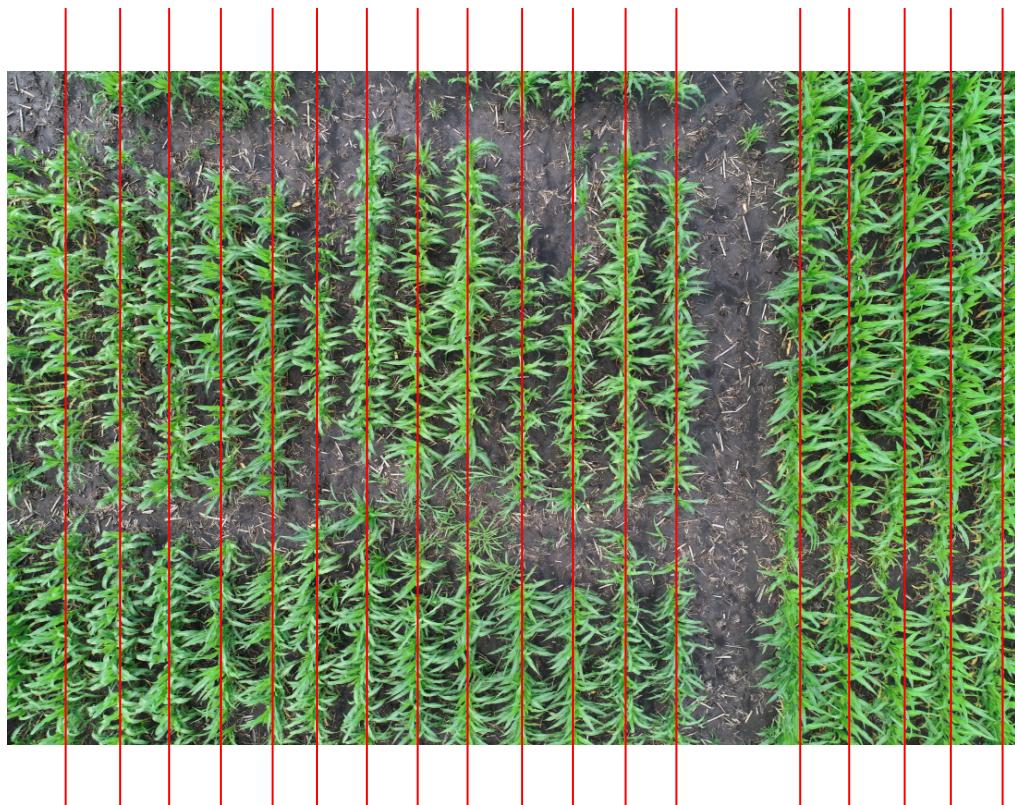
```
## The minimum and maximum correlate to centers and gaps between.  
## We will need a ratio to only choose the maximums we know to be authentic crop rows.
```



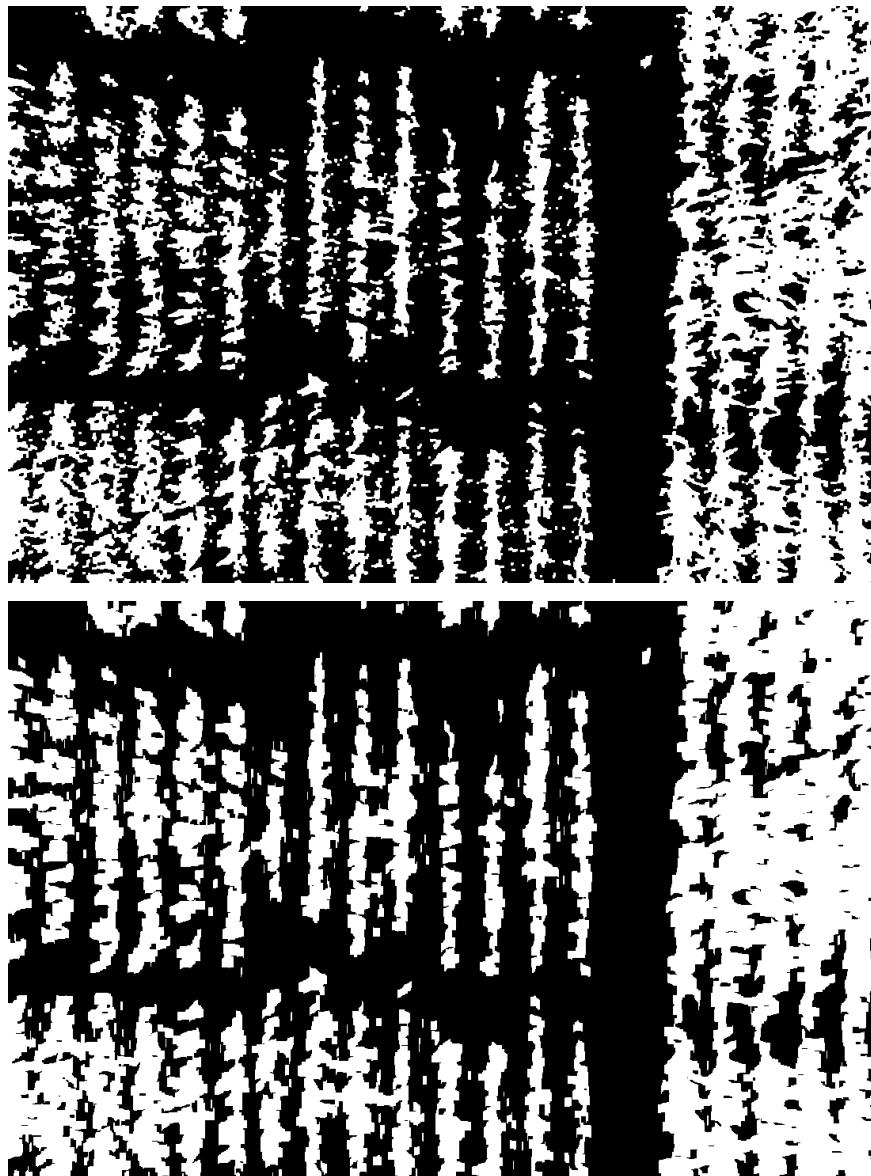
```
## Applying the ratio.
```



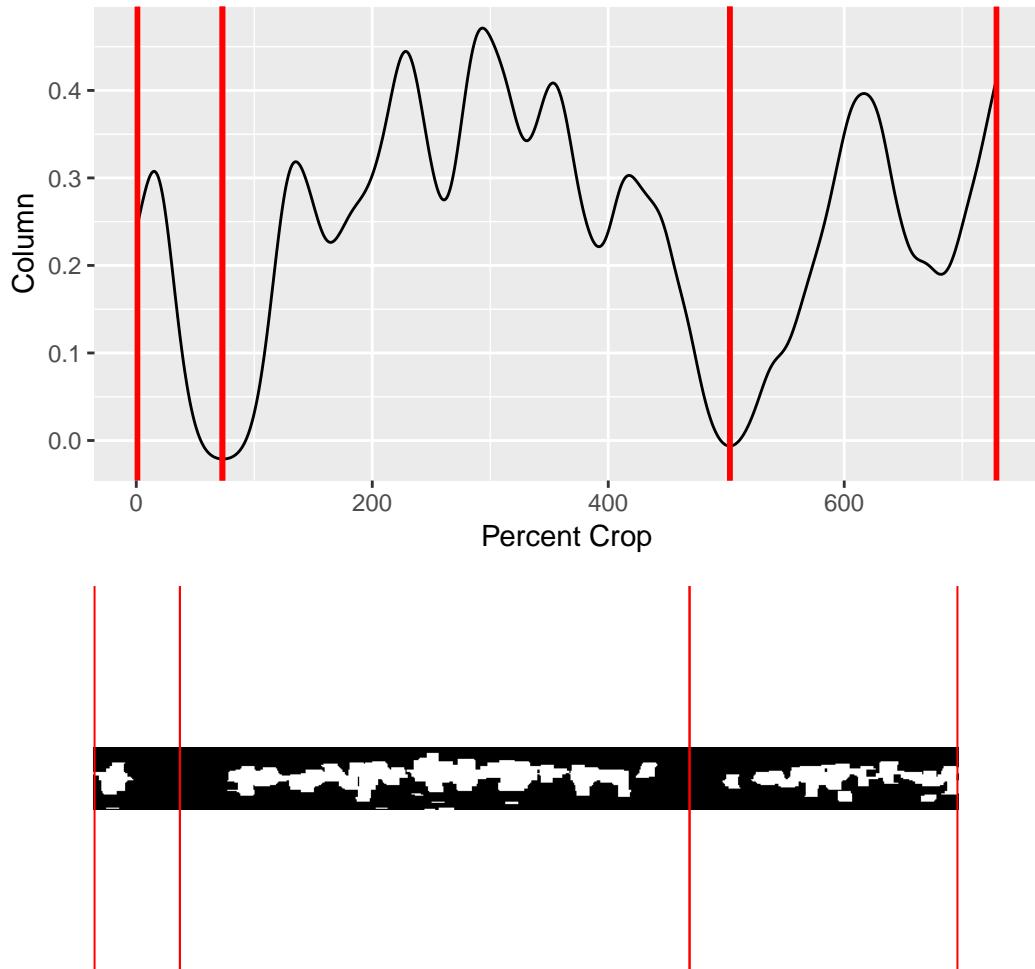
```
## The morphed image lines up well with the image for a quick validity check.
```



```
## Applying more morphology to extend vertically and trim  
## horizontally to fill in gaps within crop rows.
```



```
## By rotating the individual crop rows we found earlier we can find where  
## the breaks are within the row to make sure we include intentional gaps planted by farmers.
```



```
## Using row positions and chop positions (horizontal cutoffs)
## we can make boxes around the crop rows and then extract the smaller images for further analysis.
```

