Project: Credit card detection

Method

1. Edge detection for the input image is performed. Detected edges will be helpful in extracting structural objects in the image. Edge detection is done using cv2.canny function.
2. Contours are obtained using cv2.findContours function. Detected edge map is passed as input to the function.
3. The contours are sorted in decreasing order of area. This is done to avoid selection of minute details in the next step.
4. The contours are processed to check if the contour approximates a quadrilateral.
5. The contour approximating a polygon with 4 corners is selected and drawn on the input image to explicitly show the detected contour.

Results and Evaluation

Positive Examples

INPUT IMAGE	DETECTED CONTOUR
	
	


THE HOME DEPOT
1234 5678 0563 9024


THE HOME DEPOT
1234 5678 0563 9024


4564 7170 0000 0000
MR A H CITIZEN
VISA


4564 7170 0000 0000
MR A H CITIZEN
VISA


MasterCard
MasterCard

Failure cases

Wrong contour detected

The pattern in card causes prediction of incomplete contour of the card and the quadrilateral check fails. This causes detection of smaller polygon.

Update on failure cases

I evaluated for below design choices

1. Choosing contour of largest perimeter
2. Approximating bounding rectangle based on largest contour

Method 1 **Method 2**


Bank Alfalah
TITANIUM
4221 8200 1234 5678
07/15
07/18
SYED ARSALAN ALI
MasterCard
Bank Alfalah
TITANIUM
4221 8200 1234 5678
07/15
07/18
SYED ARSALAN ALI
MasterCard


CREDIT
1234 5678 9012 3456
11/20
GOLDENWEST MEMBER
VISA
BUSINESS
CREDIT
1234 5678 9012 3456
11/20
GOLDENWEST MEMBER
VISA

Update on Failure cases

I experimented with blurring the images before extracting edges from them. I can find the results are improved for selective cases

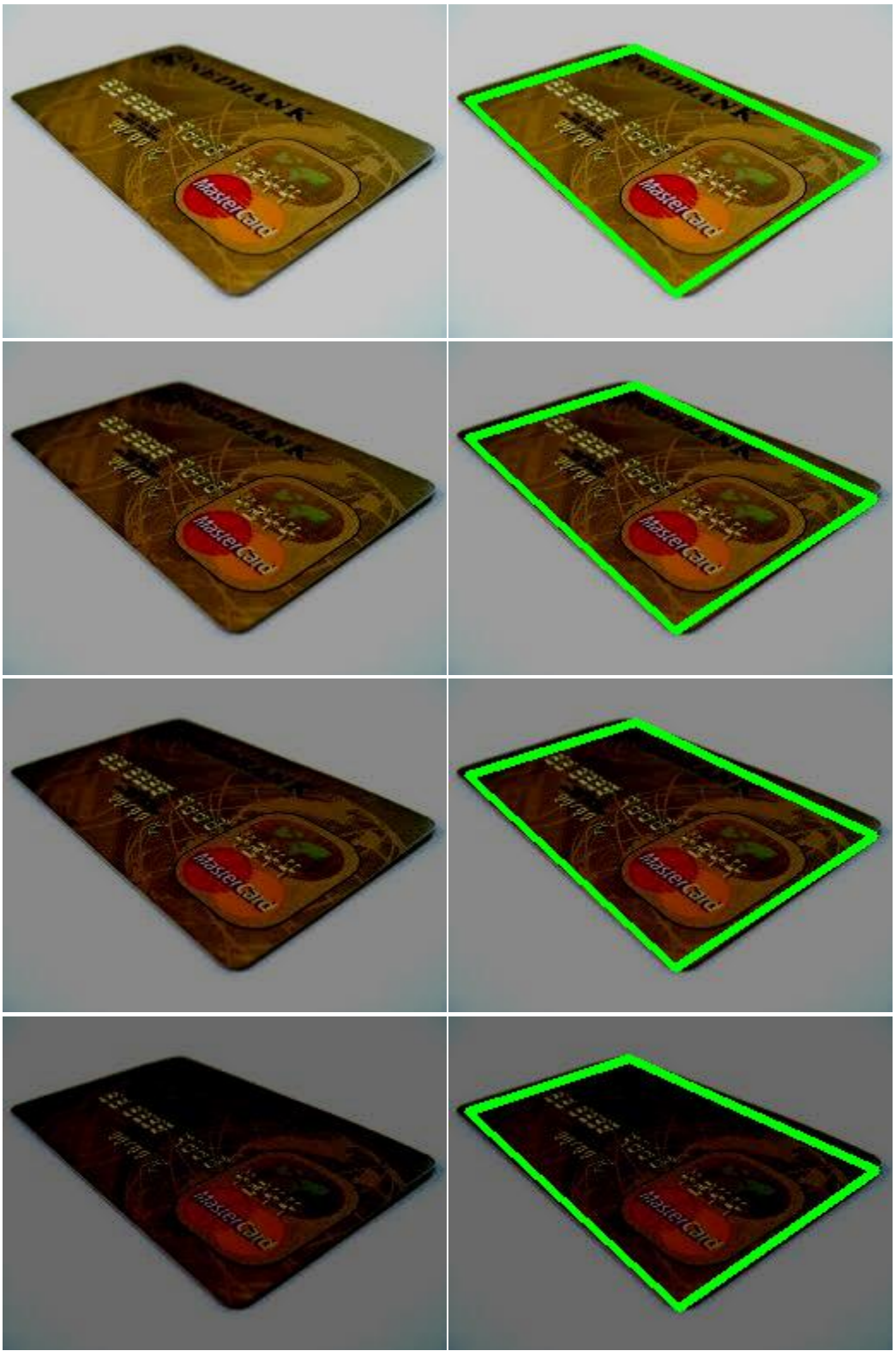
Before Blurring **After Blurring**

No improvement in this case

Evaluations

1. **Light Variation**
   Positive Examples
   Increasing Brightness

Decreasing Brightness



Increasing Brightness

Decreasing Brightness

Failure Cases

2. **Blur Variation**

Positive Examples


Bank Alfalah
TITANIUM
4221 8200 1234 5678
MasterCard
07/15
07/18
SYED AHSALAN ALI

3. **Scale Variation**

   Positive Examples


st.george
vertigo
VISA
st.george
vertigo
VISA
st.george
vertigo
VISA
st.george
vertigo
VISA
vertigo
vertigo


4564 7170 0000 0000
VISA










4. Position Variation


Meridian
VISA INFINITE
4000 1234 5678 9010
CARDHOLDER
VALID THRU 10/23
CASH BACK
VISA








Bank Alfalah
4221 8200 1234 5678
01/15
SYED AHSAN ALI
01/18
TITANIUM
MasterCard


vertigo
st.george
VISA
Platinum




Failure cases