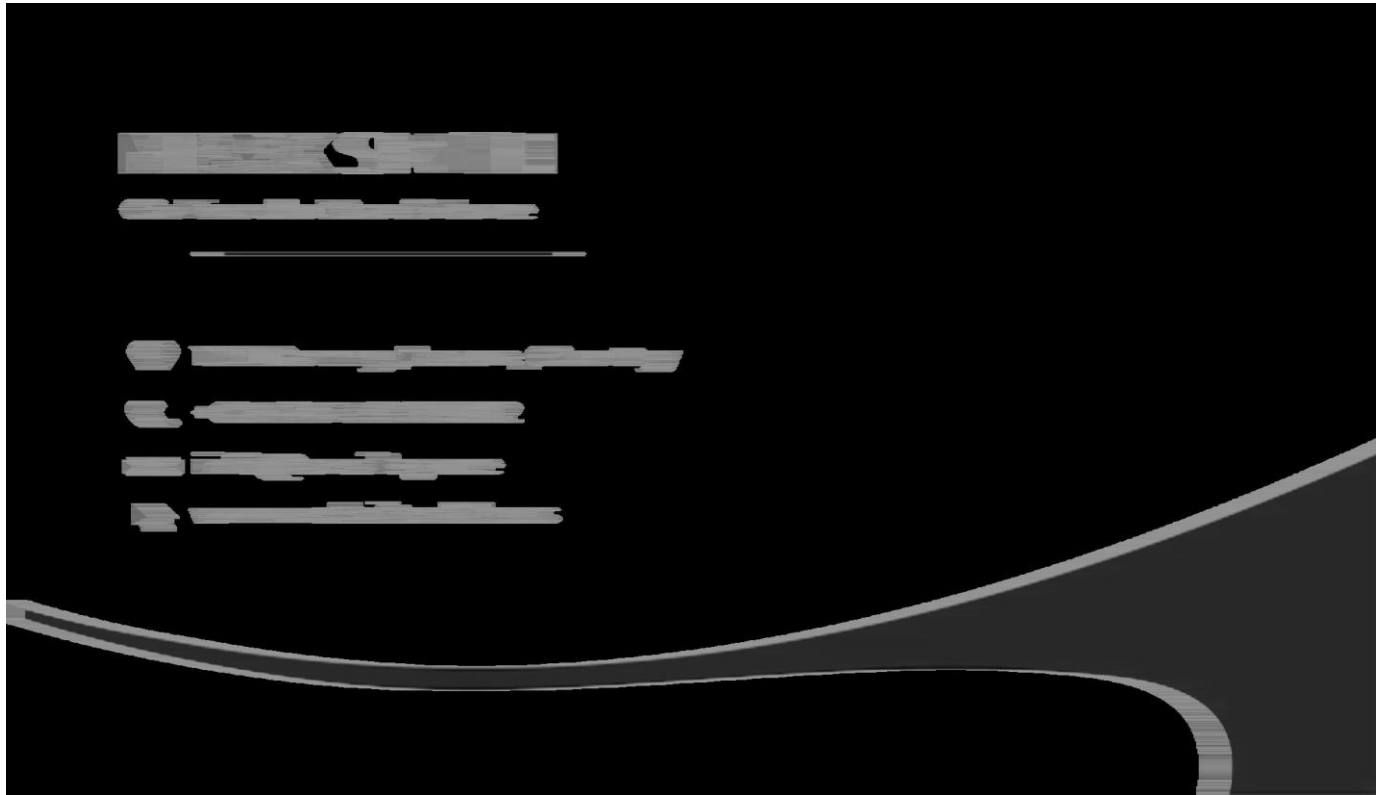


# Text Detection: horizontal Dilation



- Remove background
  - Dilation with horizontal structuring element
- ➔ Characters connected


# Text Detection: Bounding Boxes



- False detections
- ➔ Size constraints for box
- ➔ Remove box if in next step of character recognition no characters found

# Text Detection: Results

## Contact Information

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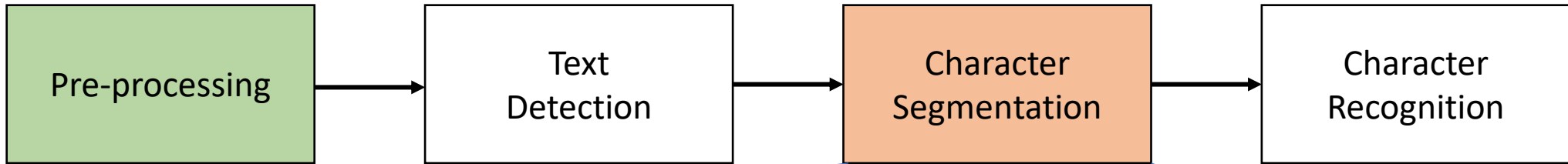
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# Character Segmentation: vertical projection



- All values zero → black

# Character Segmentation: vertical projection



- All values zero → black
- Black → white → start of character




# Character Segmentation: vertical projection



- All values zero → black
- Black → white → start of character
- White → black → end of character

# Character Segmentation: Results




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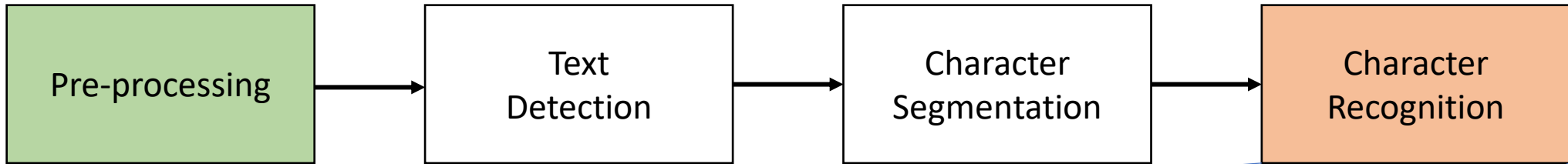
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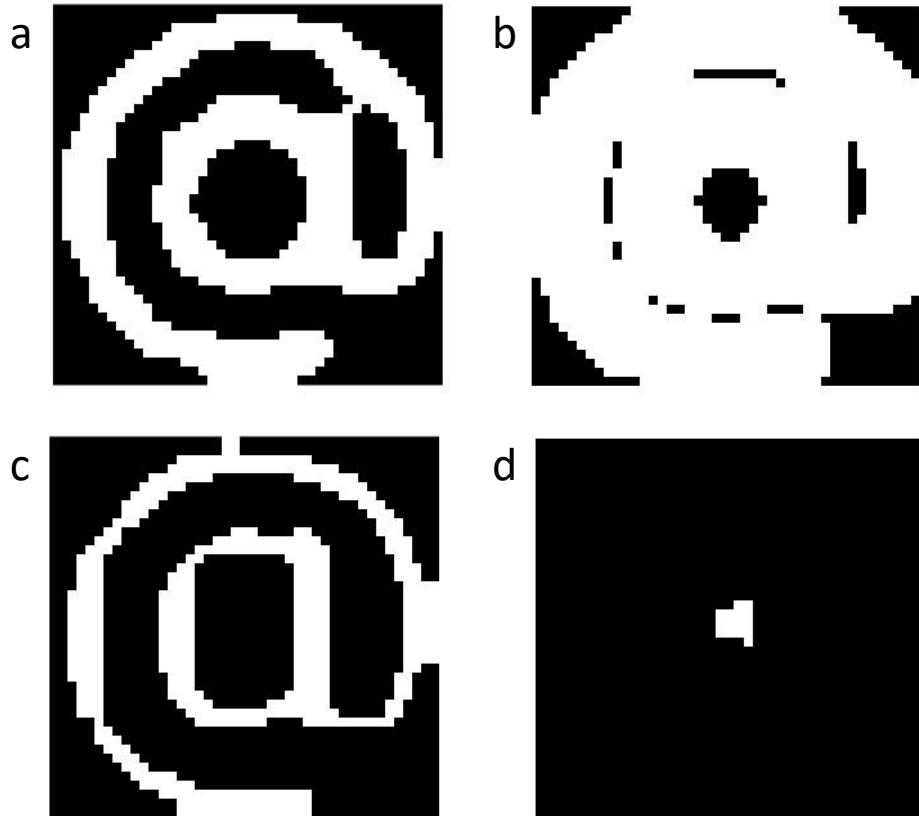
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# Character Recognition: @

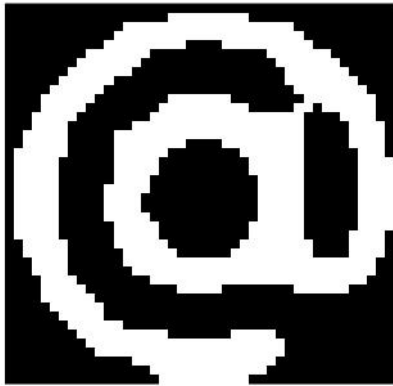
Erosion with @ mask



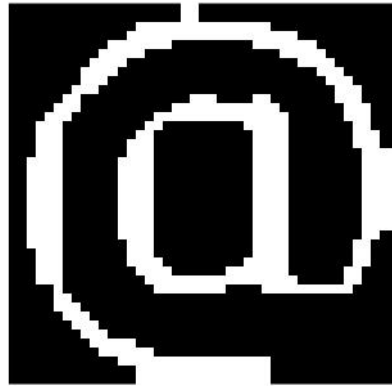
Character in  
original image

# Character Recognition: @

Erosion with @ mask



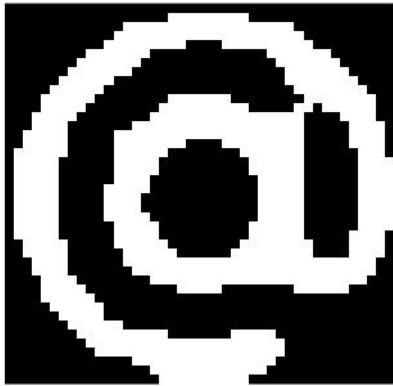
Character in  
original image



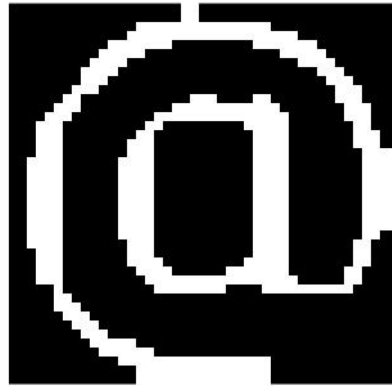
Erosion mask

# Character Recognition: @

Erosion with @ mask



Character in  
original image



Erosion mask

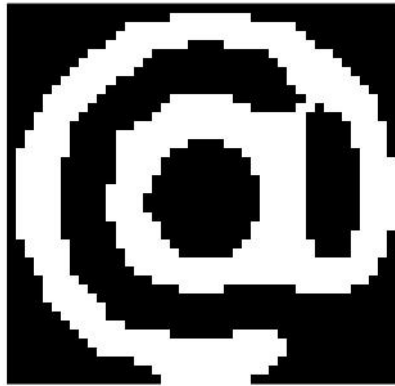
If no @ found in  
first iteration!



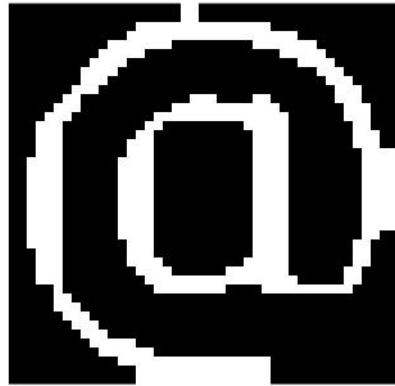
Dilated character  
in image with  
square mask

# Character Recognition: @

Erosion with @ mask



Character in  
original image

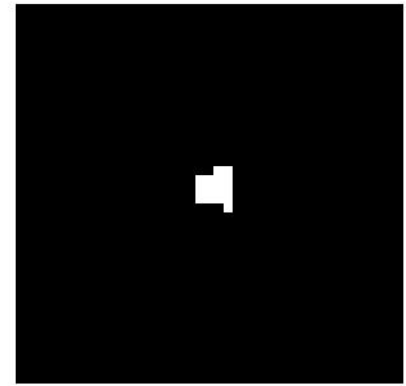


Erosion mask

If no @ found in  
first iteration!



Dilated character  
in image with  
square mask



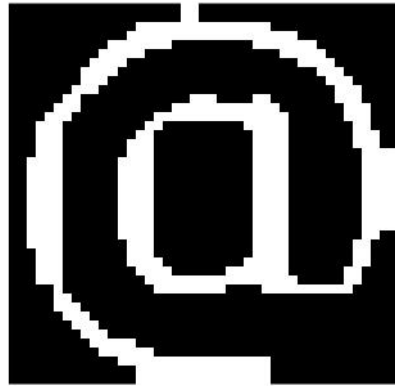
After erosion

# Character Recognition: @

Erosion with @ mask



Character in  
original image

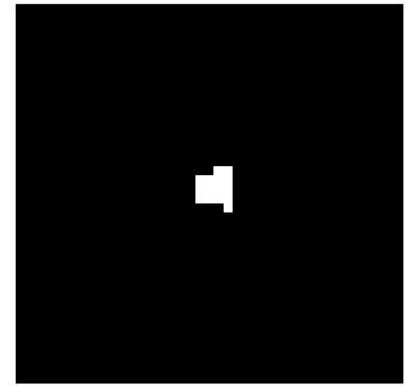


Erosion mask

If no @ found in  
first iteration!



Dilated character  
in image with  
square mask

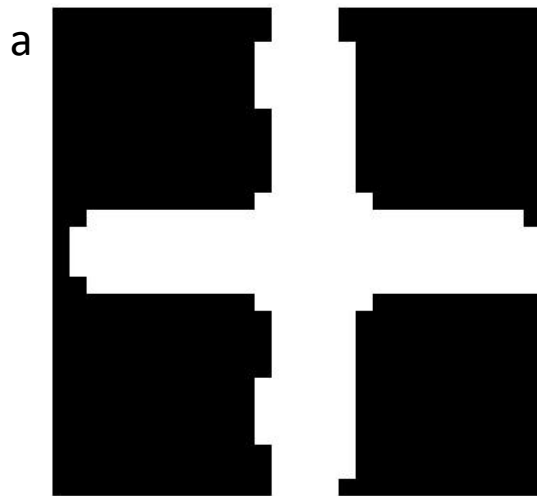


After erosion

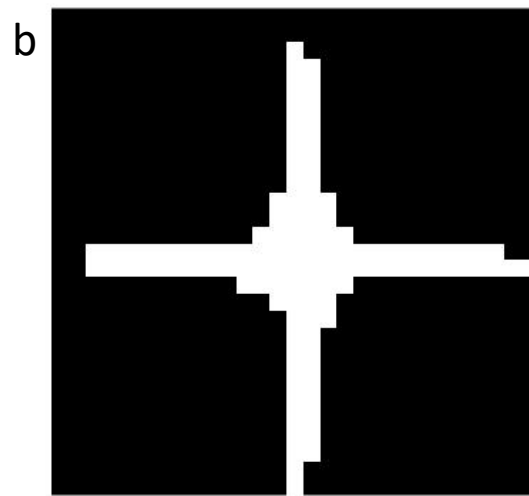


# Character Recognition: +

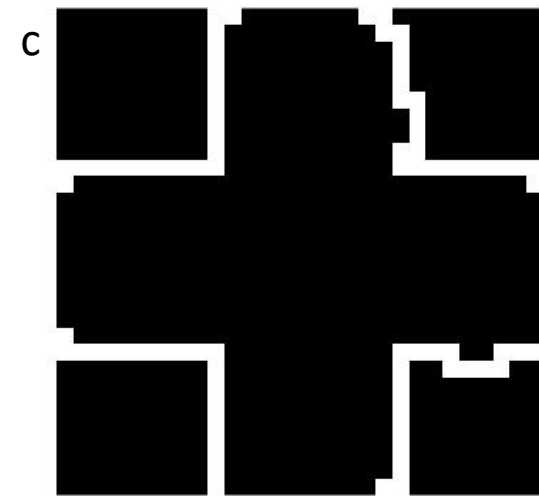
## Hit-Miss filter



Character in  
original image



Mask for erosion  
of foreground




Mask for erosion  
of background

# Character Recognition: Results

Telephone number

E-Mail Address

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# Result Statistics

Tested cards: 13

Character	Amount tested	Recognized	Not recognized	Falsely recognized
+	23	19	4	0
@	12	11	1	0

# Conclusion and Future Work



Works with many business cards

Simple operations



Method is prone to noise

Some “tuning” parameters (filter sizes, thresholds)



Recognize more characters

Put them together as words