

A decorative grid of 40 small dark gray dots arranged in 5 rows and 8 columns in the top-left corner.Abstract dark gray lines forming a large triangle on the right side and a large 'V' shape at the bottom of the slide.

IMAGE SEGMENTATION



MODEL

structure of the architecture

01

LOSS FUNCTION

misclassification penalty

02

THRESHOLD CV and POST-PROCESSING

further optimizations

03

POSSIBLE IMPROVEMENTS

TO DO

04

01

MODEL



ARCHITECTURE

U-NET shaped network with a pre-trained ENCODER (**Efficient Net**) and 5 layers-deep DECODER



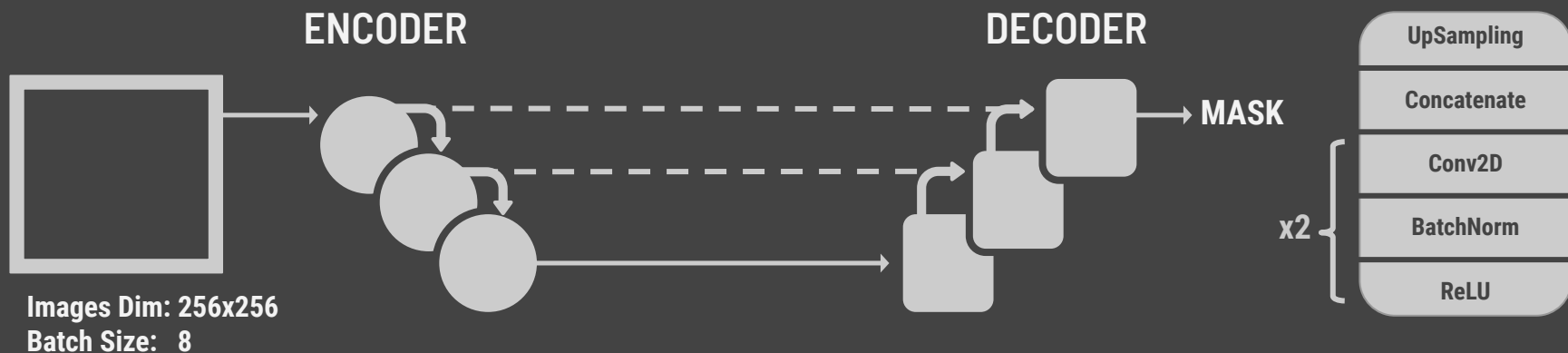
ARCHITECTURE

U-NET shaped network with a pre-trained ENCODER (**Efficient Net**) and 5 layers-deep DECODER



ARCHITECTURE

U-NET shaped network with a pre-trained ENCODER (**Efficient Net**) and 5 layers-deep DECODER



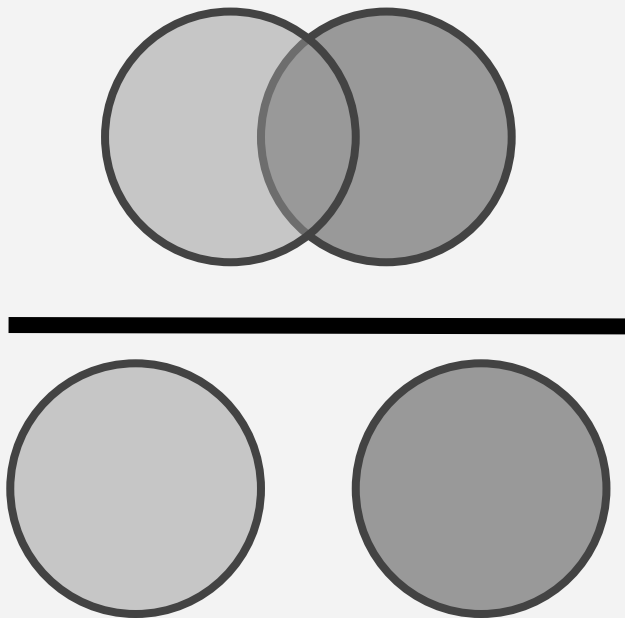


02

LOSS FUNCTION

COMBINATION OF LOSSES

1 - 2x



DICE LOSS

COMBINATION OF LOSSES



DICE LOSS

FOCAL LOSS

COMBINATION OF LOSSES

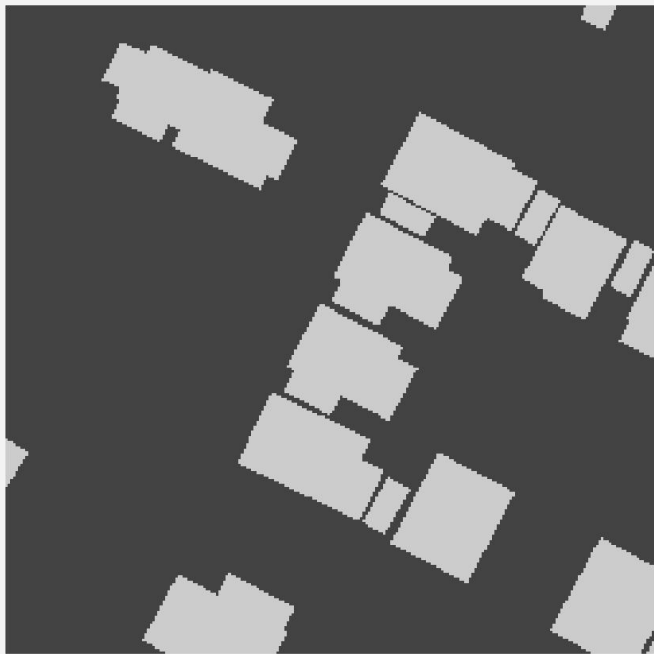
DICE LOSS

FOCAL LOSS

BORDER LOSS



COMBINATION OF LOSSES

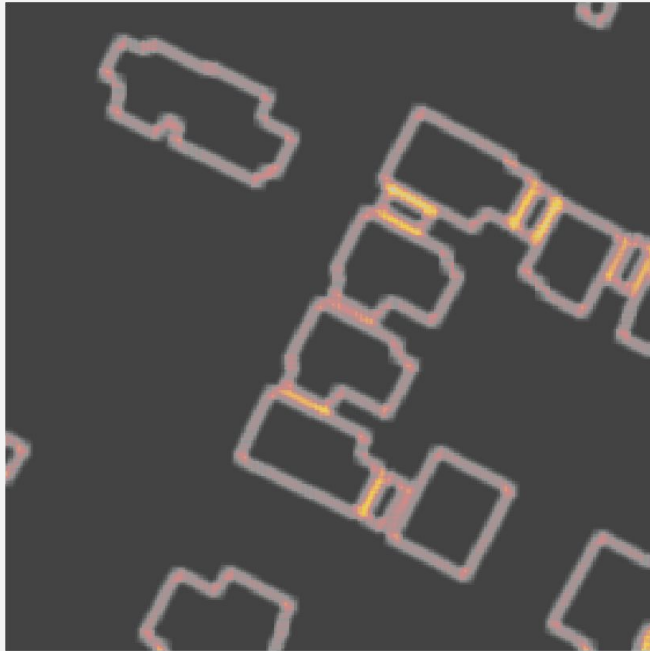


DICE LOSS

FOCAL LOSS

BORDER LOSS

COMBINATION OF LOSSES



DICE LOSS

FOCAL LOSS

BORDER LOSS

LOSSES COMPARISON

LOSSES COMPARISON



LOSSES COMPARISON

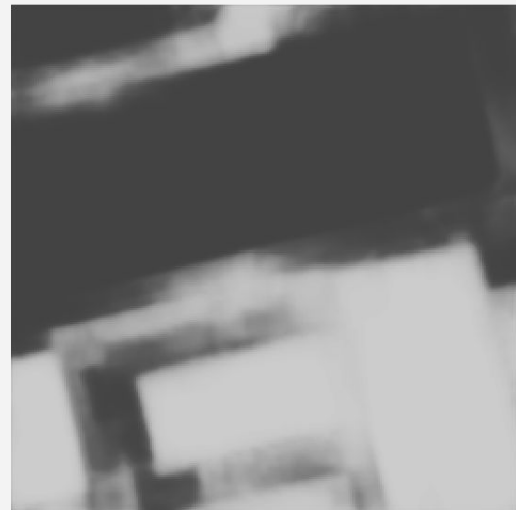
Dice+Focal+Boundary Loss

Binary Cross-Entropy

LOSSES COMPARISON

Dice+Focal+Boundary Loss

Binary Cross-Entropy

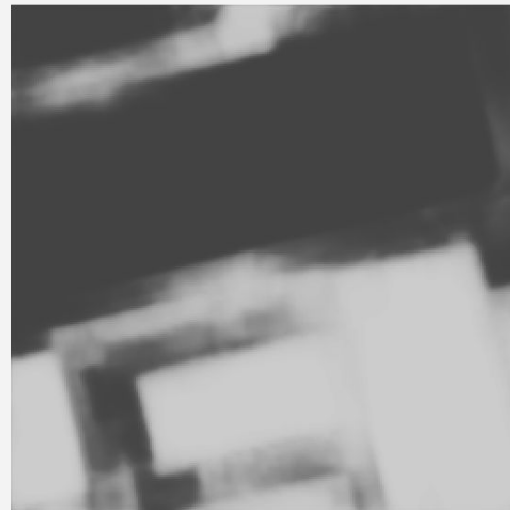


LOSSES COMPARISON

Dice+Focal+Boundary Loss



Binary Cross-Entropy



03

**THRESHOLD CV and
MASKS POST PROCESSING**

THRESHOLD CROSS-VALIDATION

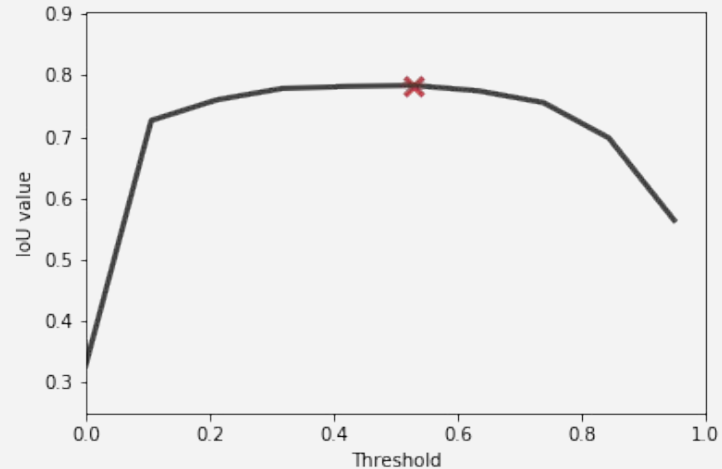
Evaluate the model with different threshold values for 0s and 1s discrimination in the prediction stage.

FIND OPTIMAL THRESHOLD

THRESHOLD CROSS-VALIDATION

Evaluate the model with different threshold values for 0s and 1s discrimination in the prediction stage.

FIND OPTIMAL THRESHOLD





POST-PROCESSING

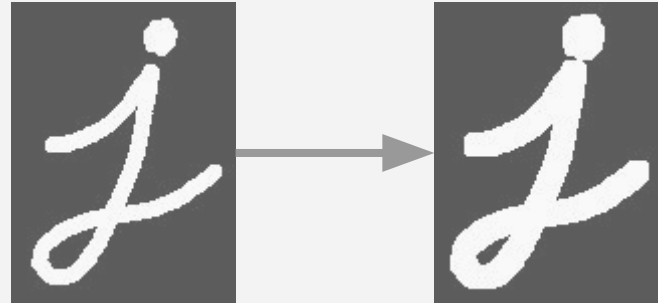
POST-PROCESSING

Post-process the images with
morphological transformations

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Post-process the images with morphological transformations

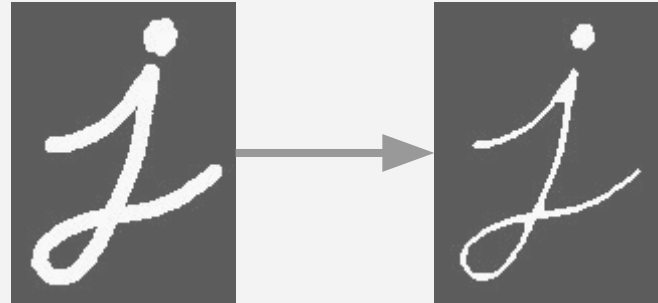
- **DILATION**



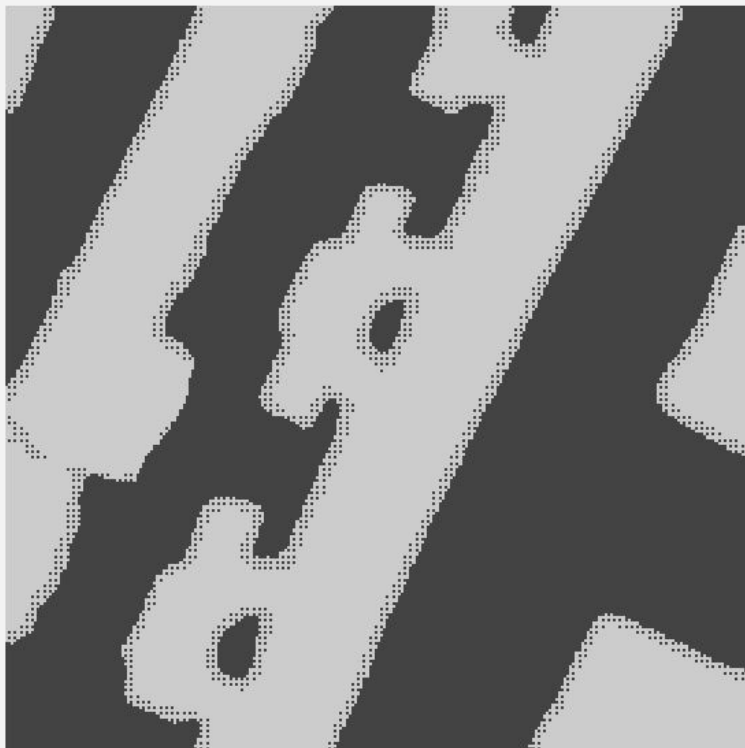
POST-PROCESSING

Post-process the images with morphological transformations

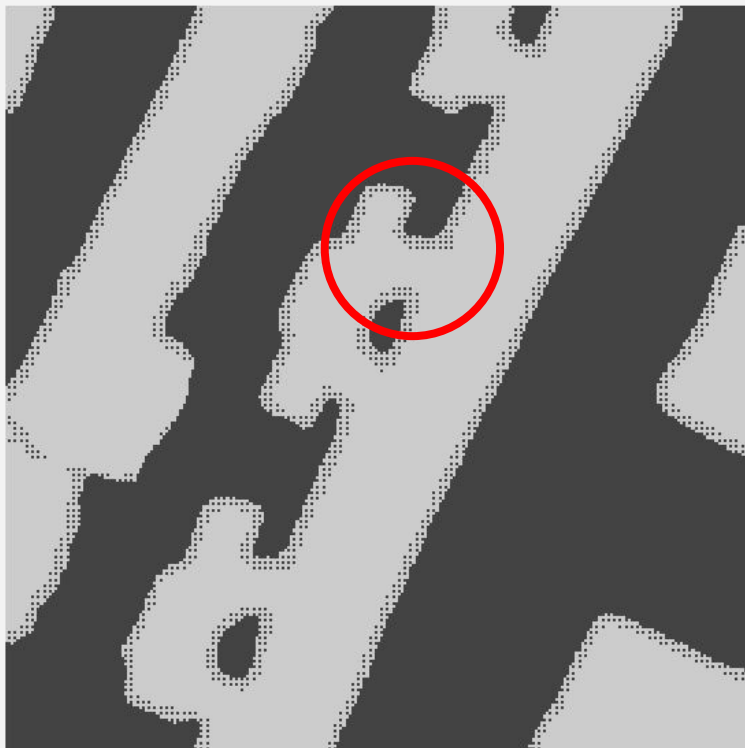
- **DILATION**
- **EROSION**



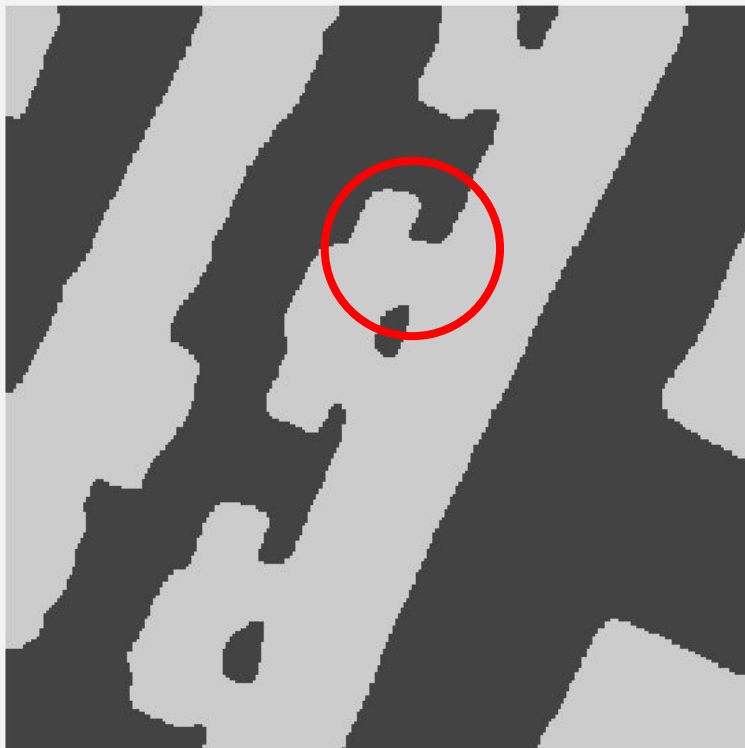
UNPROCESSED PREDICTION



UNPROCESSED PREDICTION



PROCESSED PREDICTION





4. IMPROVEMENTS

POSSIBLE IMPROVEMENTS

- **APPLY DATA AUGMENTATION**
FLIPS/SMALL ROTATIONS
INCREASE CONTRAST - DYNAMICAL RANGE
SHARPENING
- **EXPERIMENTING WITH OTHER BACKBONES or DIFFERENT ARCHITECTURES (LinkNet, FPN-Net, PSPNet)**
- **ENSEMBLE METHODS**



REFERENCES AND LINKS

[Efficient-Net](#)

[Border Loss](#)

[Morphological transformations](#)



Abstract geometric lines in dark gray on the left side of the slide. One line starts at the top left, goes down and to the right, then up and to the right, then down and to the right, and finally up and to the right. Another line starts at the bottom left and goes up and to the right. A third line starts at the bottom left and goes up and to the right, parallel to the second line.

THANK YOU