

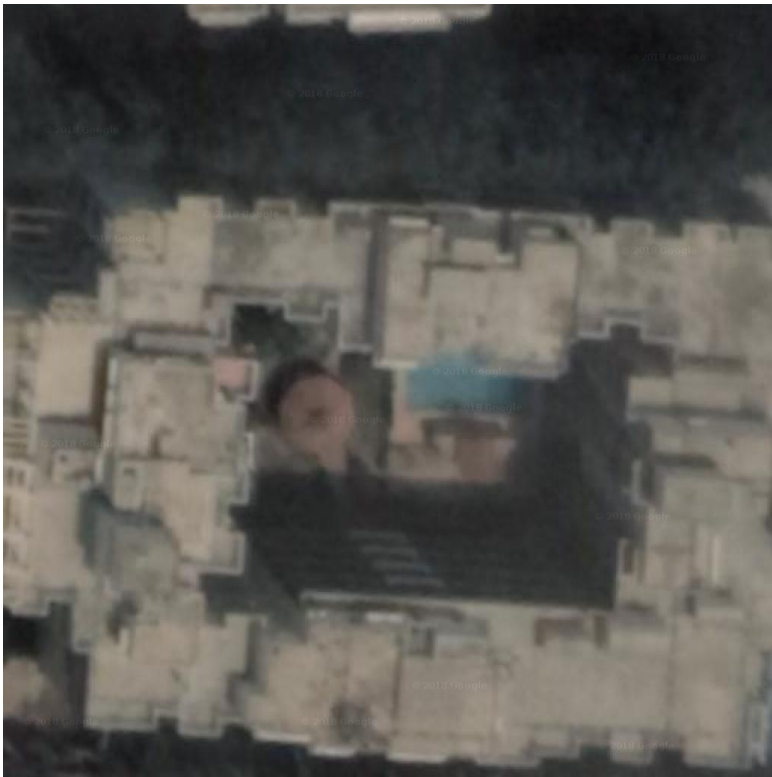
# MULTISCALE IMAGE SEGMENTATION FOR VARYING OBJECT SIZE IN AN IMAGE

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# PROBLEM: COMPLEXITY IN SATELLITE IMAGES

- Initial goal: Building segmentation in satellite images, but satellite images are big so generally solutions crop them images and feed to the neural network this can lead to these two problems:
  - An object can be very small part of the image.
  - An object can be very big part of the image.
- To solve these problem using single neural network would be difficult plus the complexity of the network would have to be high in order to achieve higher accuracy.

# COMPLEXITY IN SATELLITE IMAGES: EXAMPLE

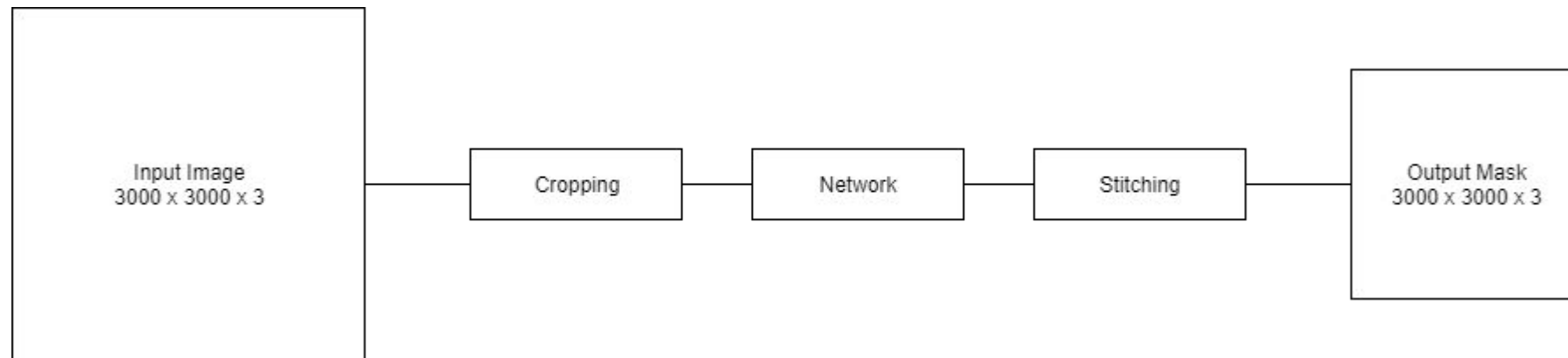


Variation in  
to-be-segmented  
Object size



# TRADITIONAL APPROACHES

- Cropping and feeding then stitching



# DRAWBACKS OF TRADITIONAL APPROACHES

- Network needs to be complex.
- Network needs to learn the variance of target object size.
- One Ratio isn't enough.

# OUR PROPOSAL

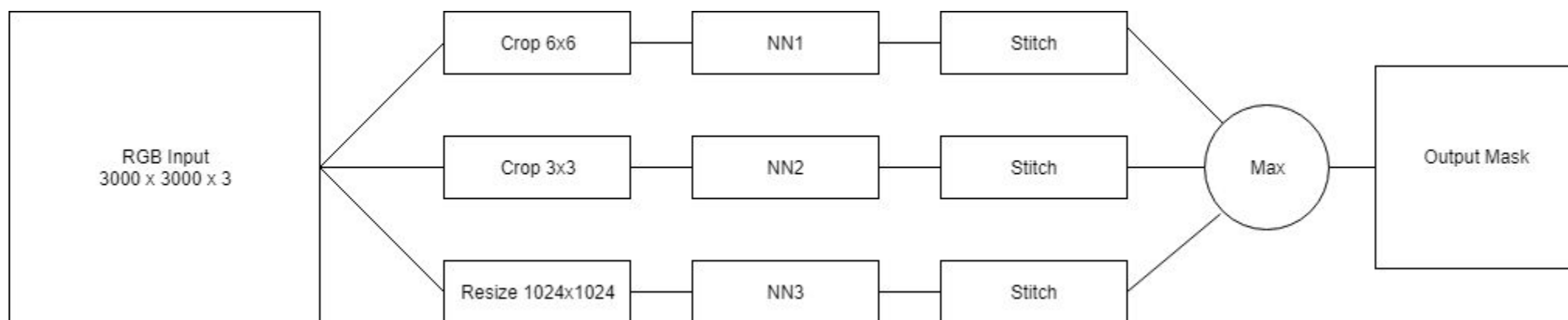
- Have different cropping ratios: images with different sizes will lead to each network specialize in different object sizes.
- Kind of an ensemble of three networks

# DATASET: DSTL

- DSTL provides you with 1km x 1km satellite images in both 3-band and 16-band formats.
- The 3-band images are the traditional RGB natural color images. The 16-band images contain spectral information by capturing wider wavelength channels.
- DSTL has labeled 10 different classes: Buildings, Misc. Manmade structures, Road, Track, Trees, Crops, Waterway, Standing water, Vehicle Large, Small



# ARCHITECTURE





# CONCLUSION

- In this project we proposed an Neural Network architecture that can be used when your target object occupies varying amount of area in your input Image.
- The Ratios can be determined by studying the data one small rule can: 'Let the smallest ratio be in which the smallest target object is completely fitted in one cropped image'.