



MOTIVATION

BEFORE DISASTER

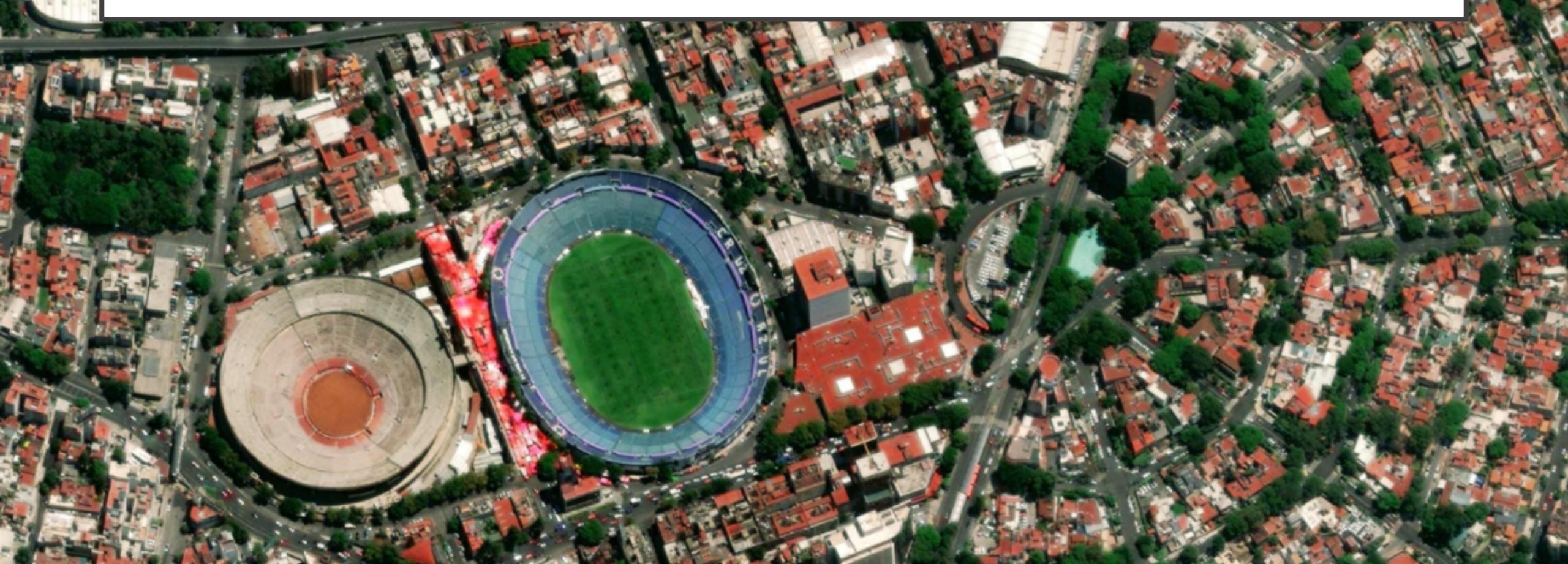


AFTER DISASTER

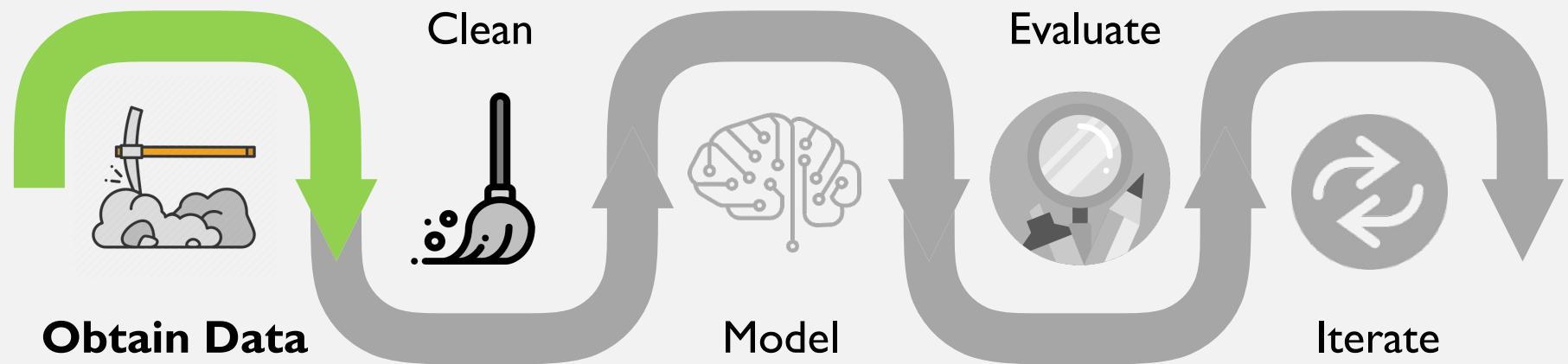


SIGNS FROM ABOVE: BUILDING DETECTION FROM SATELLITE IMAGERY

BROOKE ANN COCO



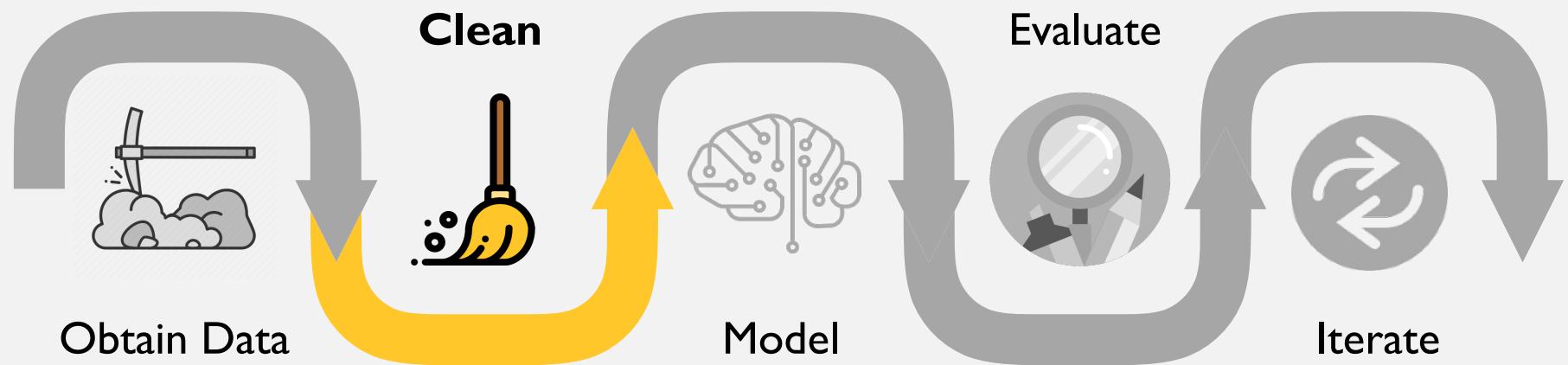
METHODOLOGY



- SpaceNetChallenge.github.io
 - Las Vegas
 - ~ 3900 images



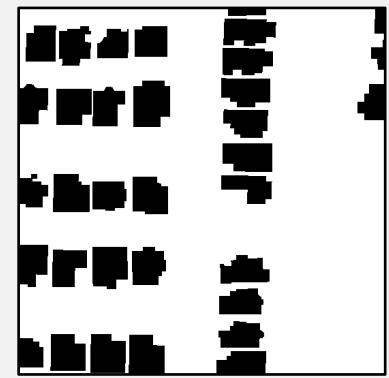
METHODOLOGY



- Reorganize source images to 8-bit
- Transform labelled data to image masks

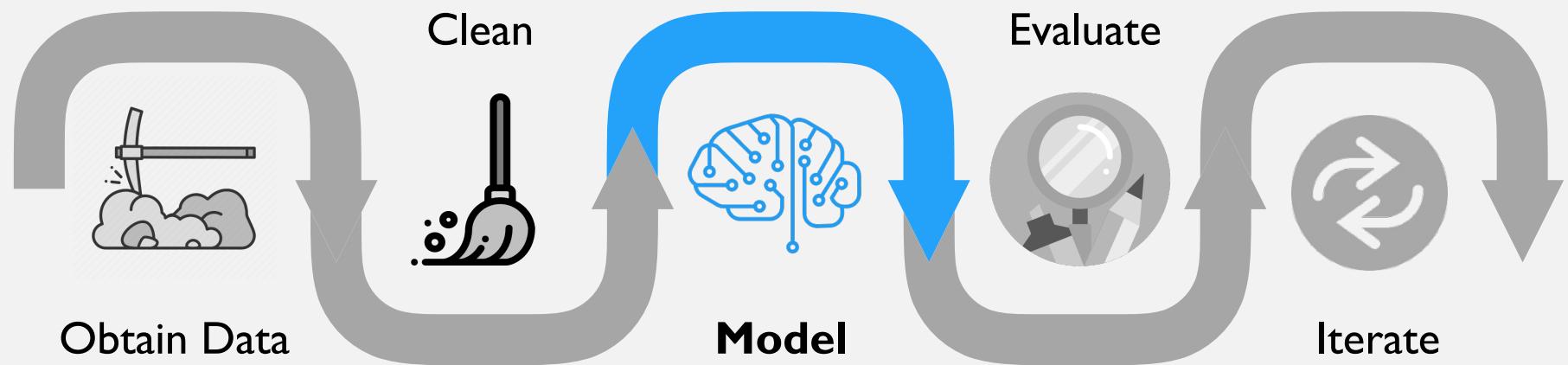


Source Image



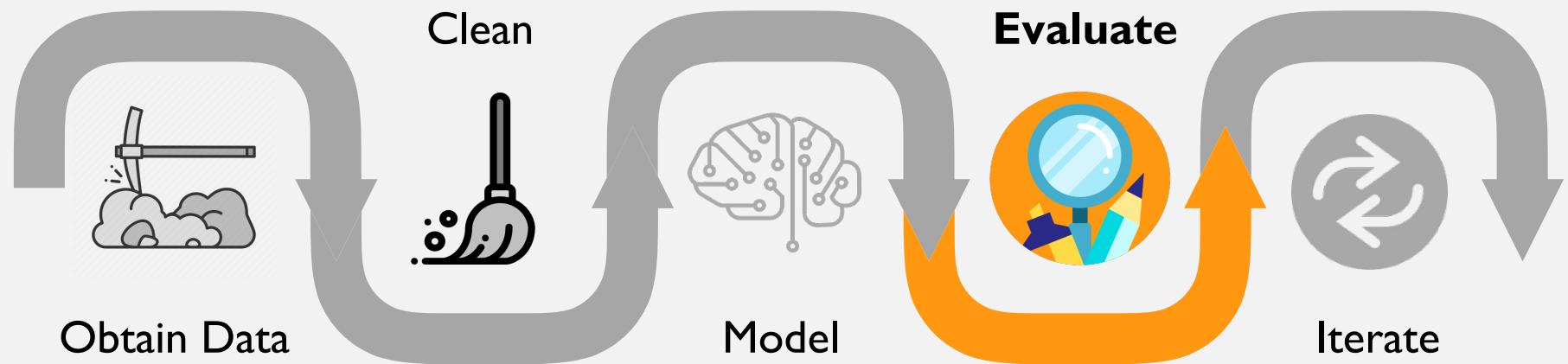
Ground Truth

METHODOLOGY



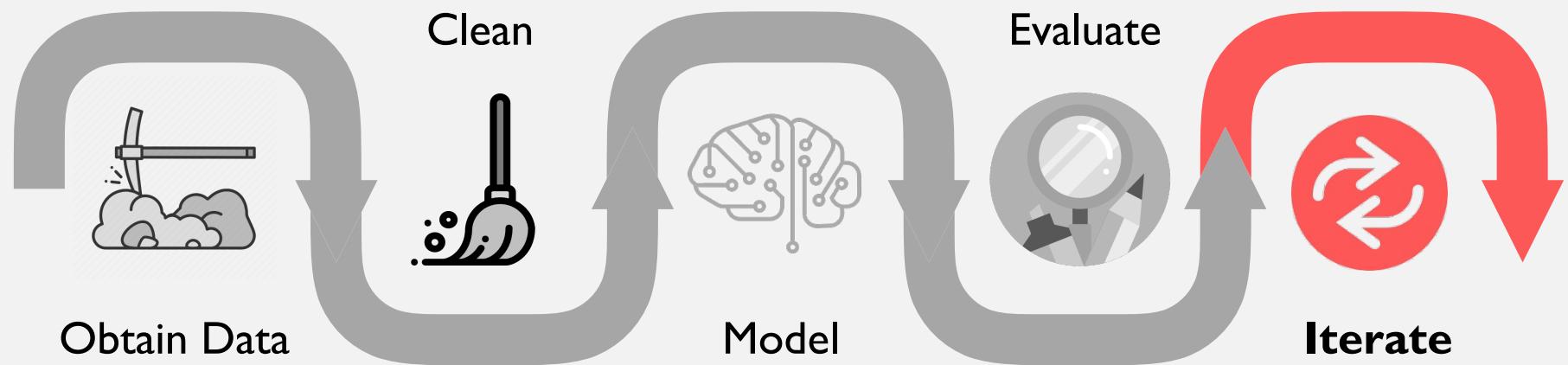
- Fully Convolutional Network
- 28 Layers

METHODOLOGY



- Optimize dice coefficient

METHODOLOGY

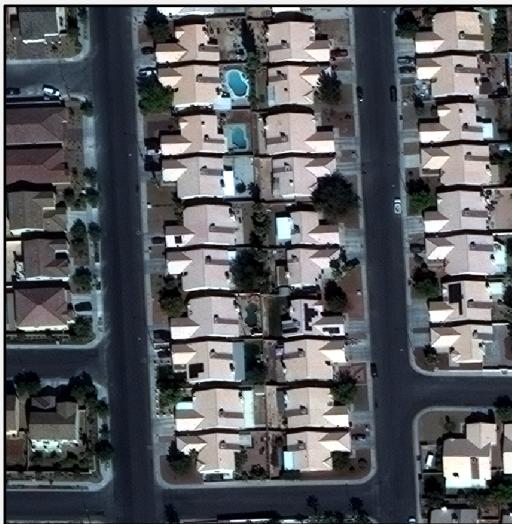


- Tune parameters

RESULTS

INPUT

Source Image



Dice Coefficient: 0.70

Binary Accuracy: 91%

RESULTS

INPUT



Dice Coefficient: 0.70

Binary Accuracy: 91%

RESULTS

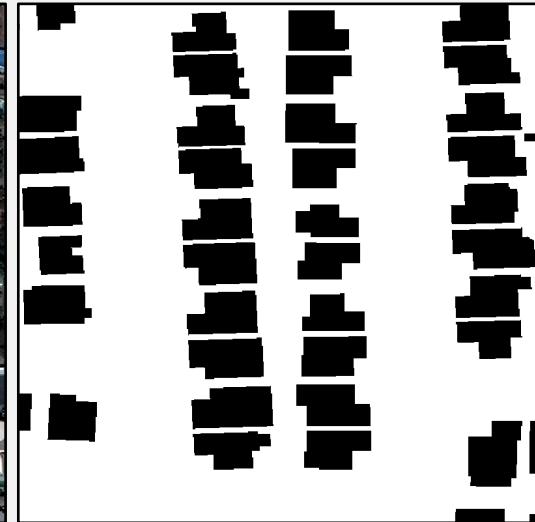
INPUT

OUTPUT

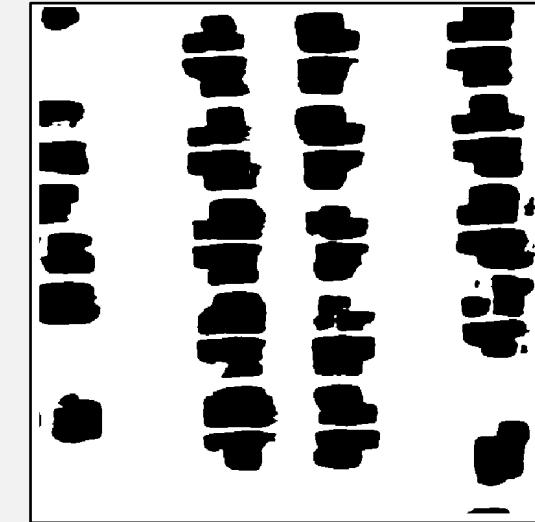
Source Image



Ground Truth



Model Prediction

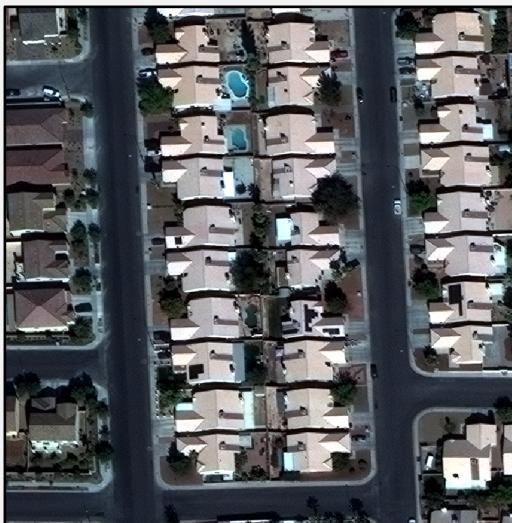


RESULTS

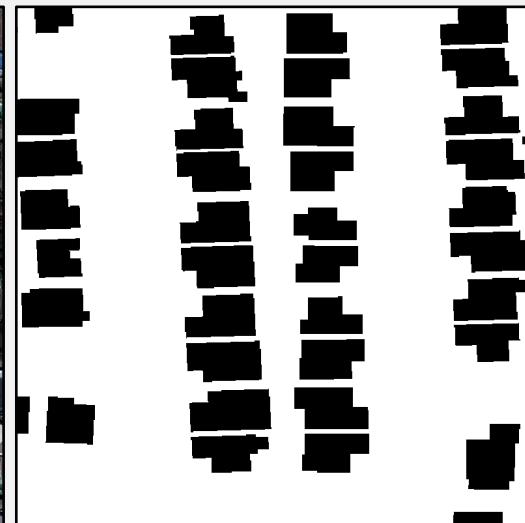
INPUT

OUTPUT

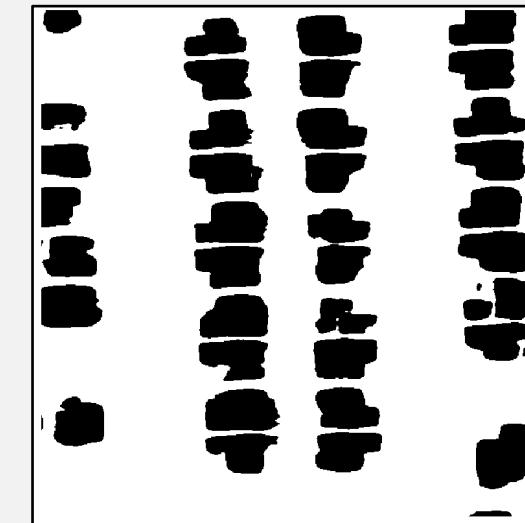
Source Image



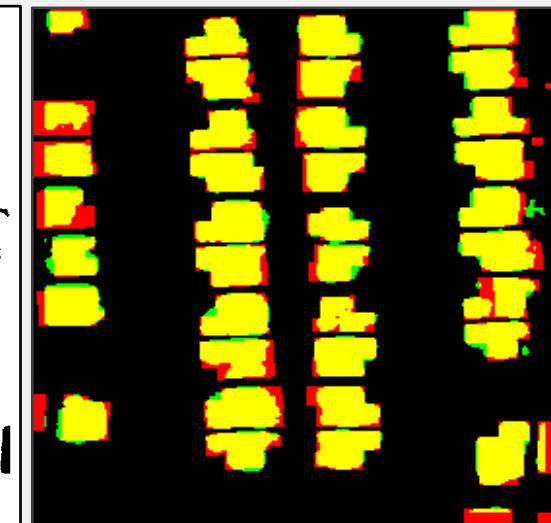
Ground Truth



Model Prediction



Difference



Building
Correct
Non-Building
Correct

Building
Incorrect
Non-Building
Incorrect

BEFORE DISASTER

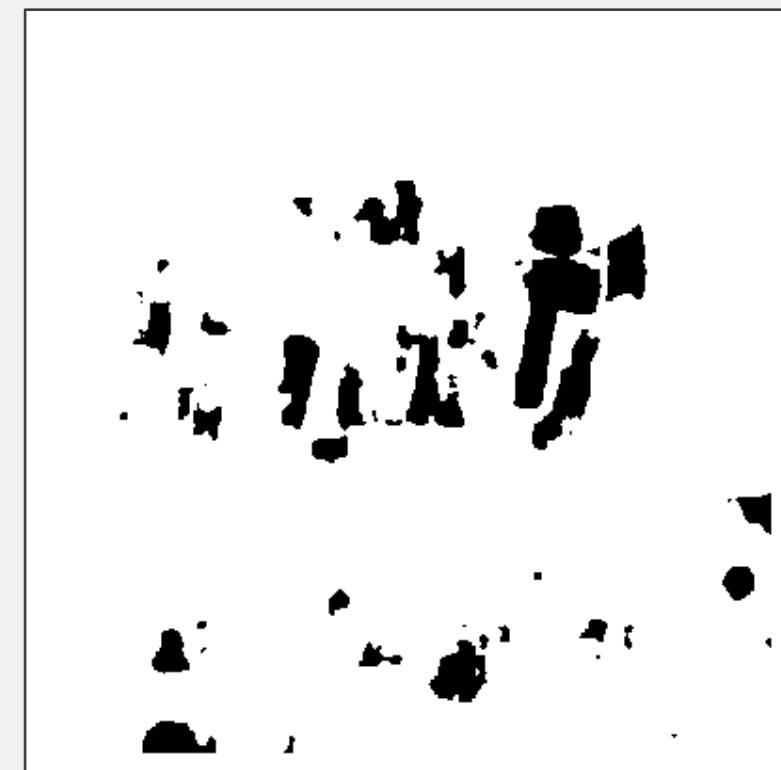
SOURCE IMAGE



Bidganeh Missile-Related Facility, Iran

November 3, 2011

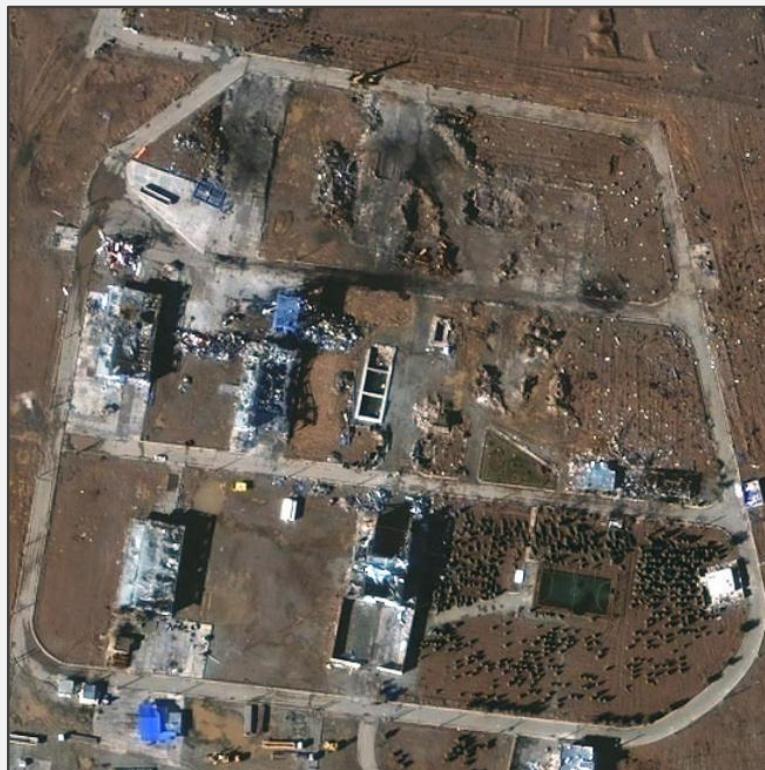
MODEL PREDICTION



6.5%
Building
Coverage

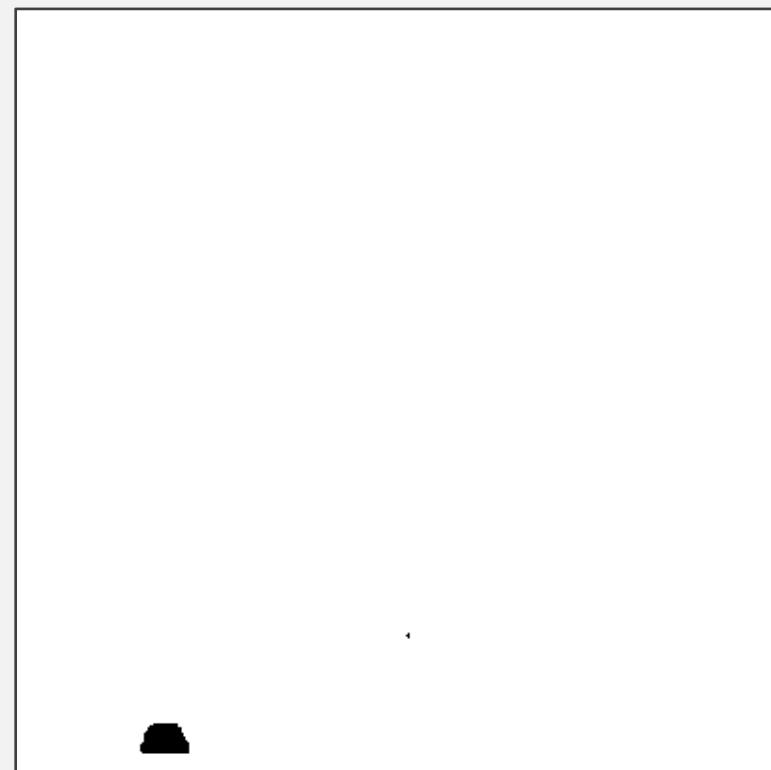
AFTER DISASTER

SOURCE IMAGE



Bidganeh Missile-Related Facility, Iran November 22, 2011

MODEL PREDICTION



0.2%
Building
Coverage

THANK YOU

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