Image Recognition At Pixel Level By Artificial Intelligence

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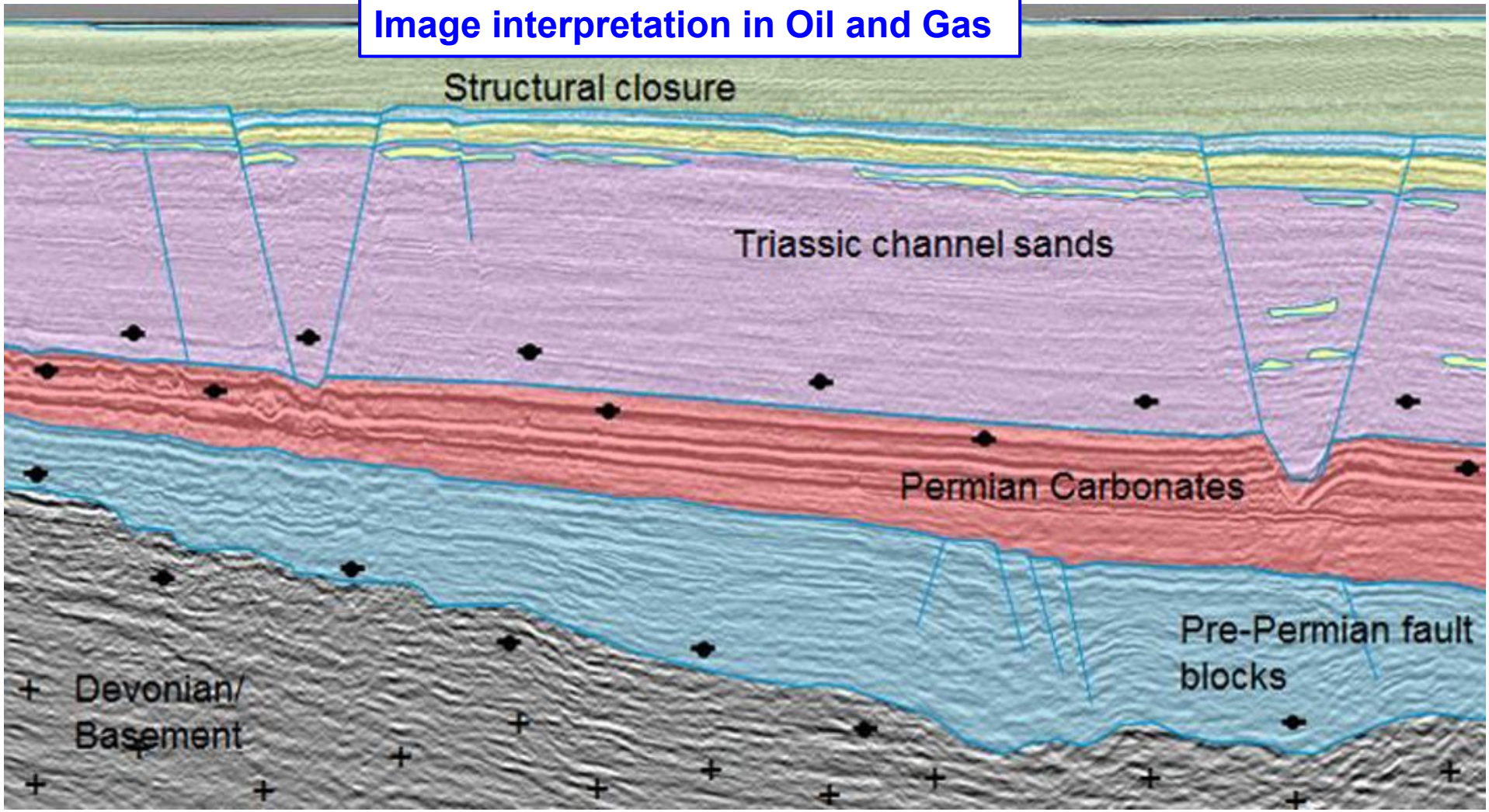
Galvanize

Capstone Project

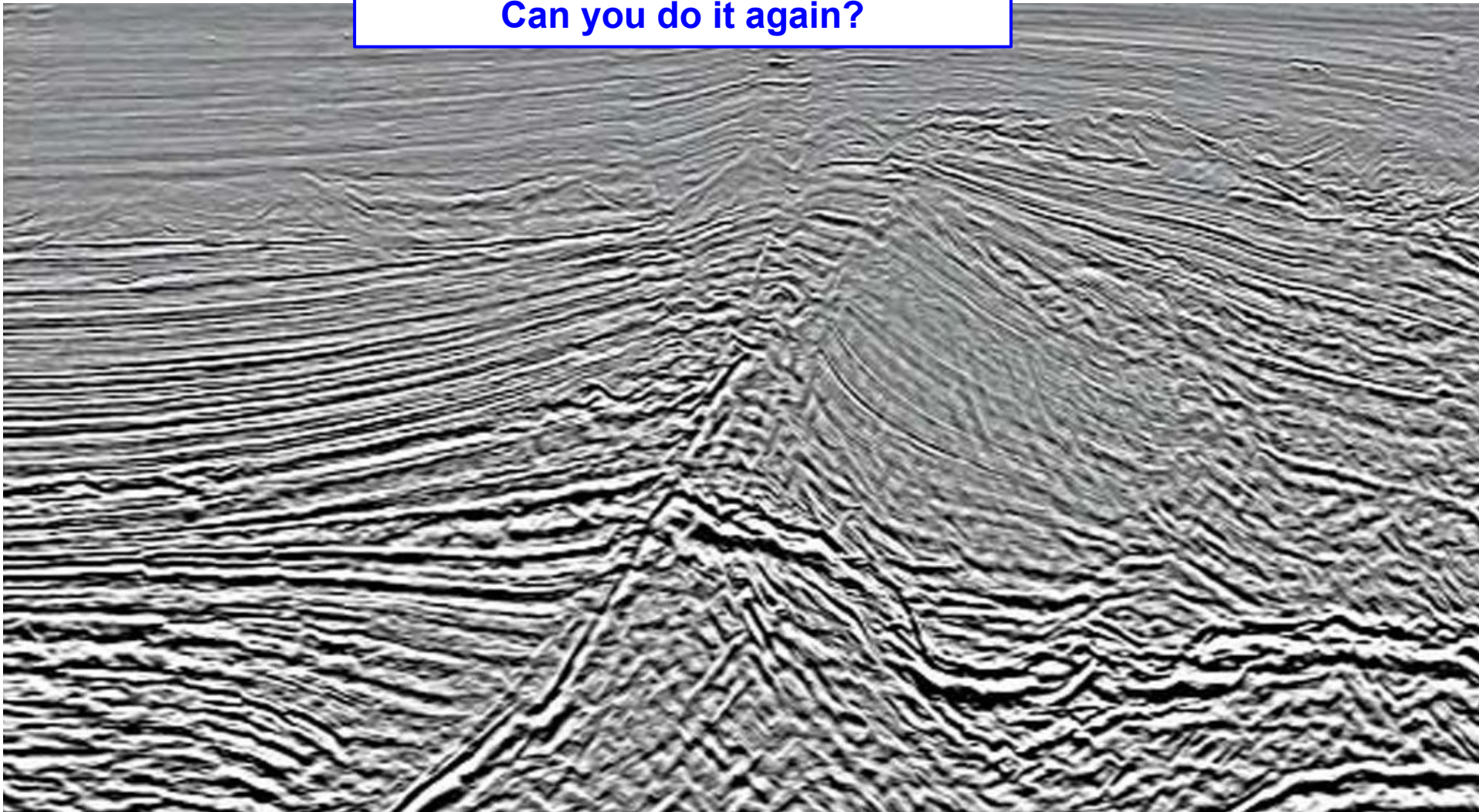
Outline

- Motivation
- Method: Deep Learning/Artificial Intelligence
- Results and Demo

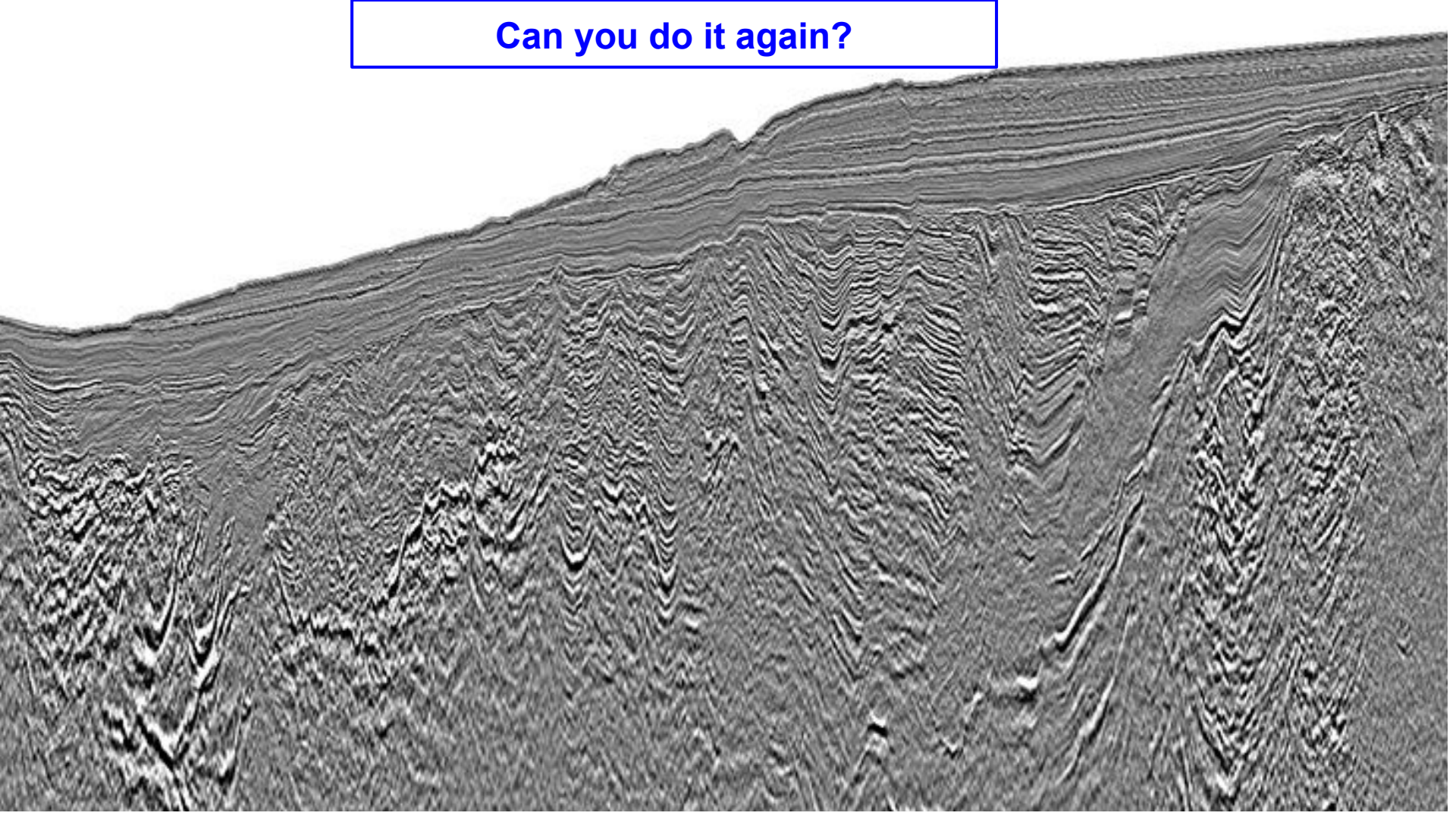
Image interpretation in Oil and Gas



Can you do it again?



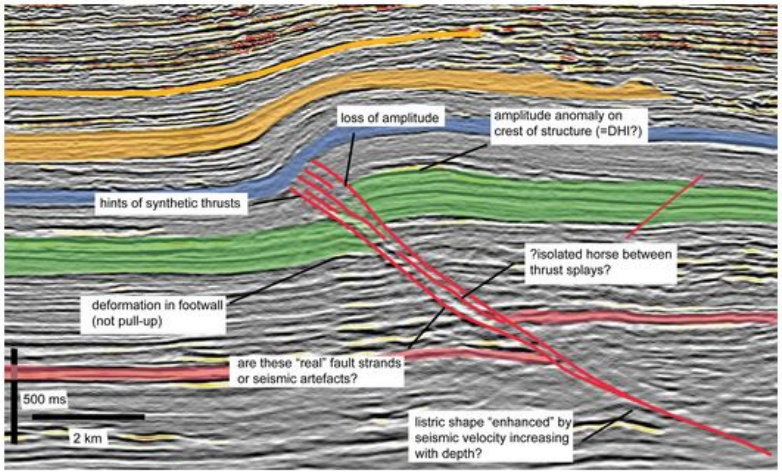
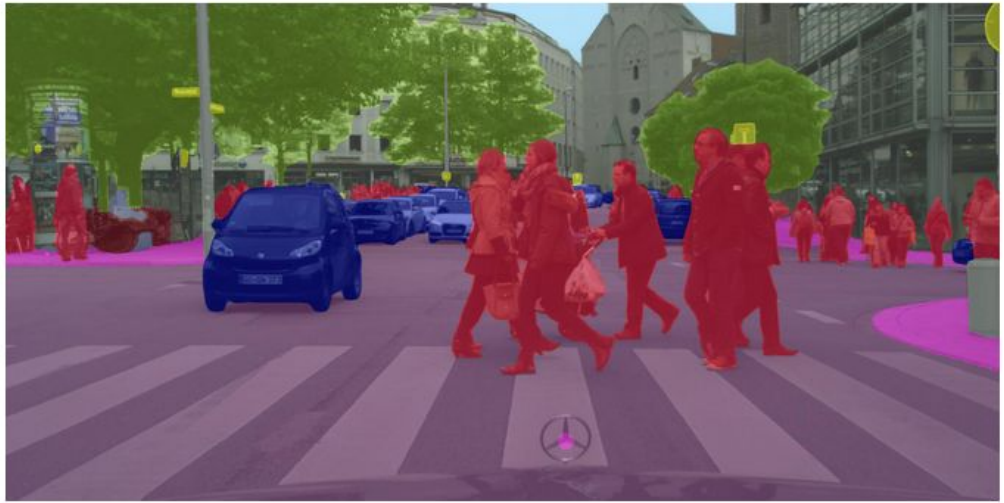
Can you do it again?



Can you do it again?

Motivation

Artificial Intelligence/Deep Learning is growing like crazy in recent years. What is the state of art algorithm for the image interpretation at pixel level?

Seismic Interpretation	Semantic Segmentation
	

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Successful Deep Learning Project

ADE20K Labeled Images
150 Categories, and 1055 Scenes

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Platforms

amazon web services™ | EC2

K + TensorFlow

PYTORCH

Deep Learning with PyTorch

Successful Deep Learning Project

ADE20K Labeled Images
150 Categories, and 1055 Scenes

Algorithms?

Platforms

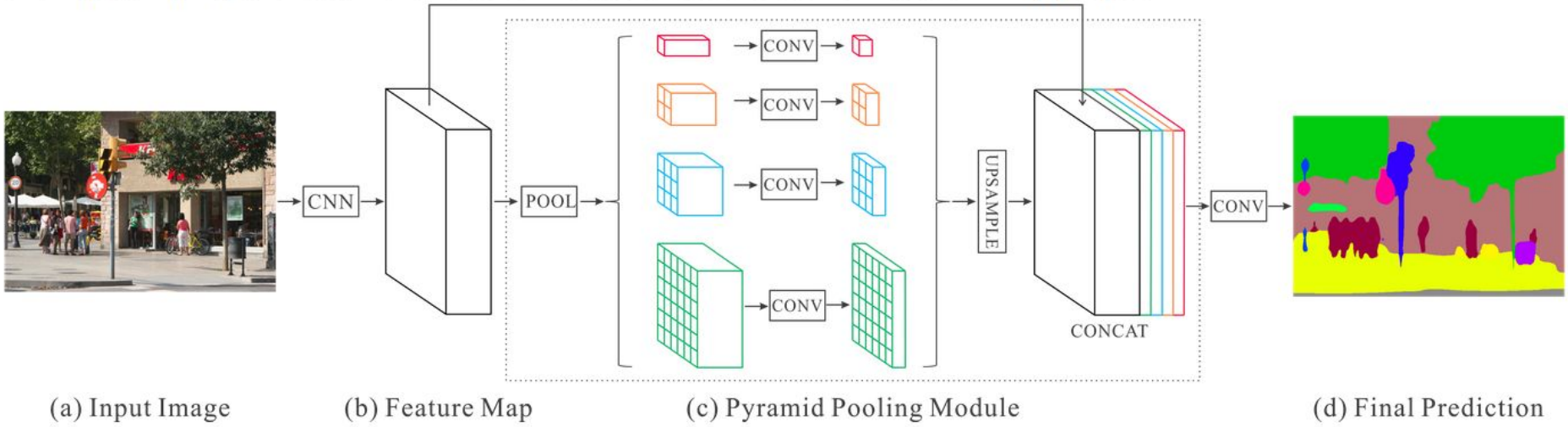
amazon web services™ | EC2

K + TensorFlow

PYTORCH

Deep Learning with PyTorch

Network Structure For My Capstone Project



Courtesy: H. Zhao et al. 2016

Github:https://github.com/HoustonJ2013/Capstone_DL_Object_detection

One sentence summary :
We need pixel level resolution

One sentence summary :
Big picture is needed to make the right decision

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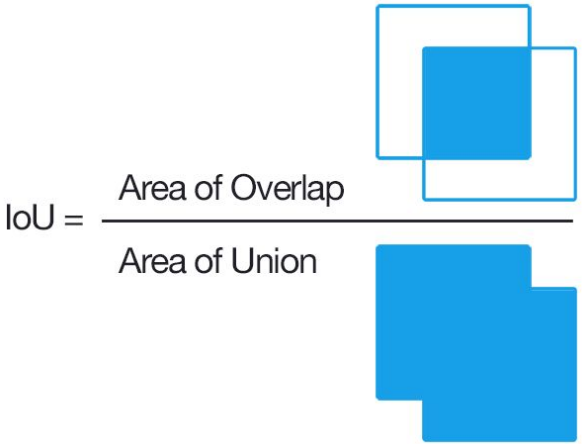
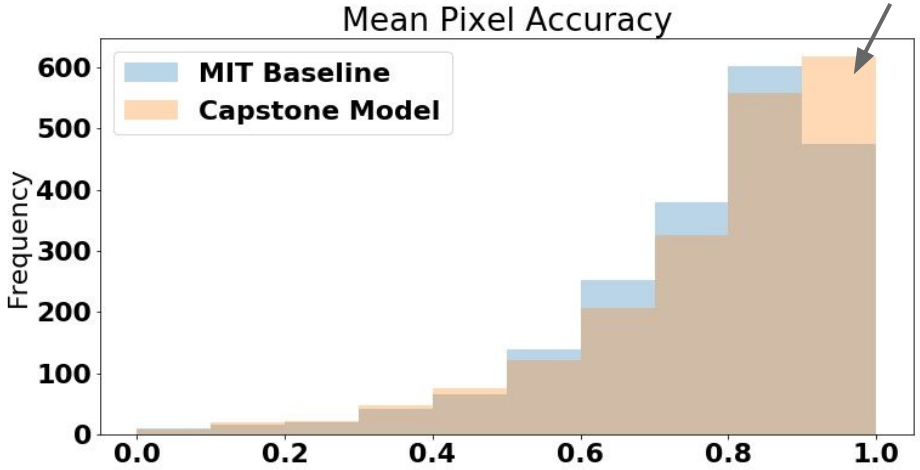
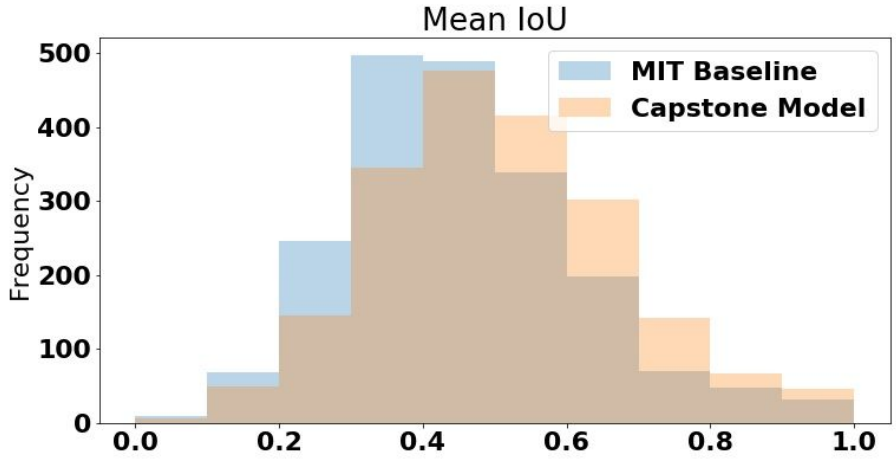
Results:

Model	Mean Pixel Accuracy	Mean IoU
MIT Baseline Model	0.7805	0.36
Capstone Model	0.7951	0.406



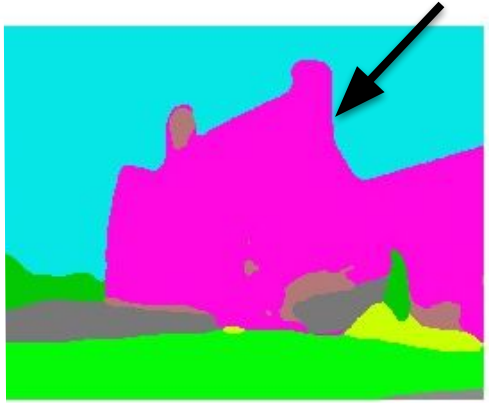




House or Building, which is more right?

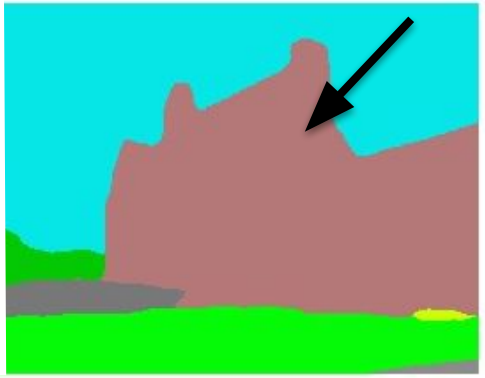
Raw Image | Human Label | Prediction

MIT Baseline



Acc 0.632
IoU 0.620

Capstone



Acc 0.952
IoU 0.777

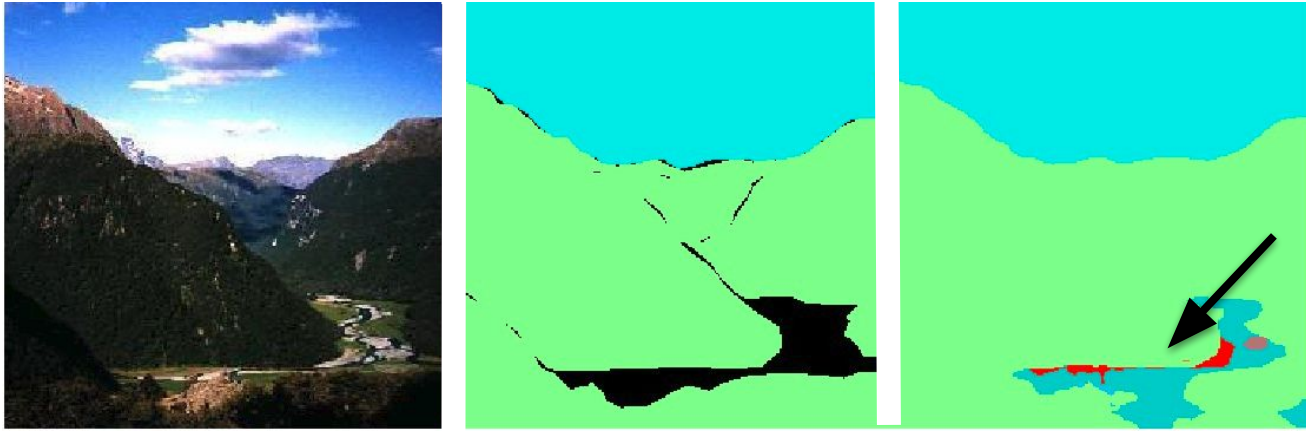
Learned to Identify River

Raw Image | Human Label | Prediction

MIT Baseline

Acc 0.971
IoU 0.969

Capstone Model



Acc 0.999
IoU 0.980

Thanks

github
SOCIAL CODING

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PYTORCH
Deep Learning with PyTorch

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Contact

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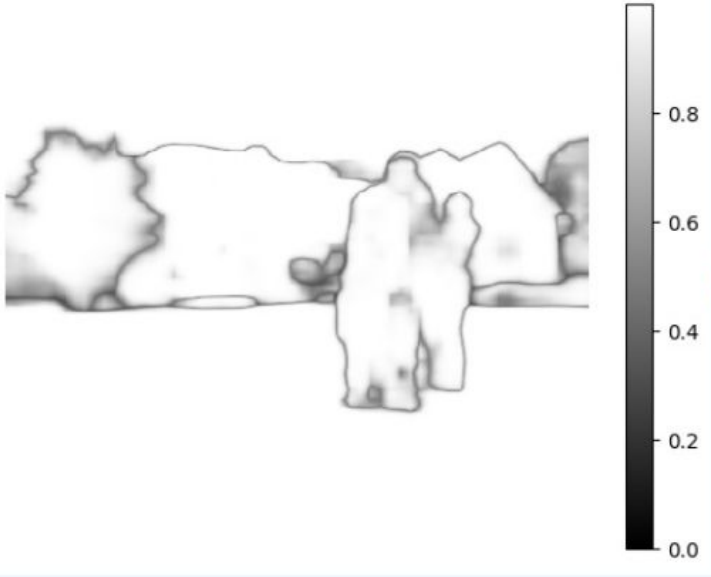
- linkedin : https://www.linkedin.com/in/jingbo-liu/
- Github: https://github.com/HoustonJ2013/Capstone_DL_Object_detection

Live Demo if have time

18.218.165.142:5000


0.8
0.6
0.4
0.2
0.0


building
sky
floor
tree
windowpar
grass
cabinet
sidewalk
person
plant