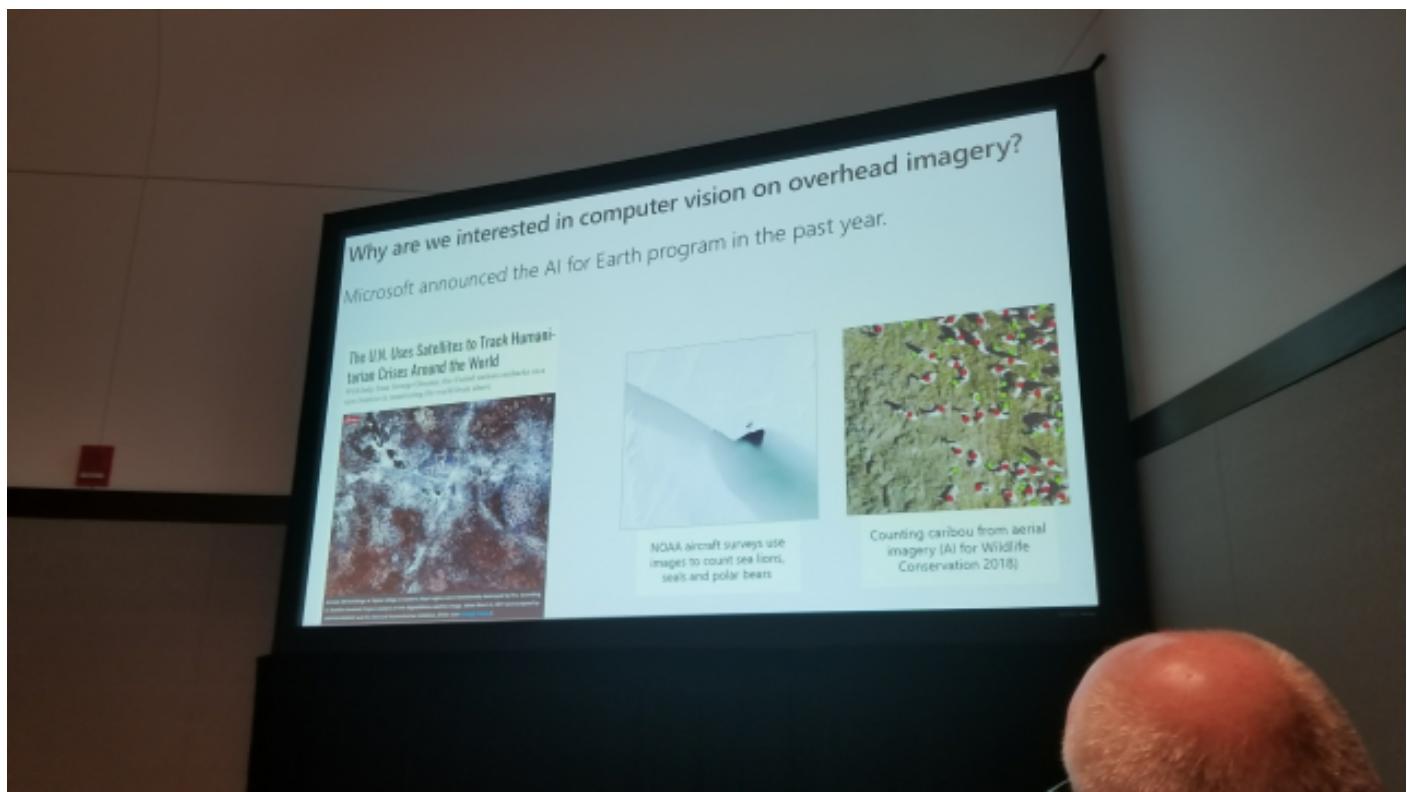


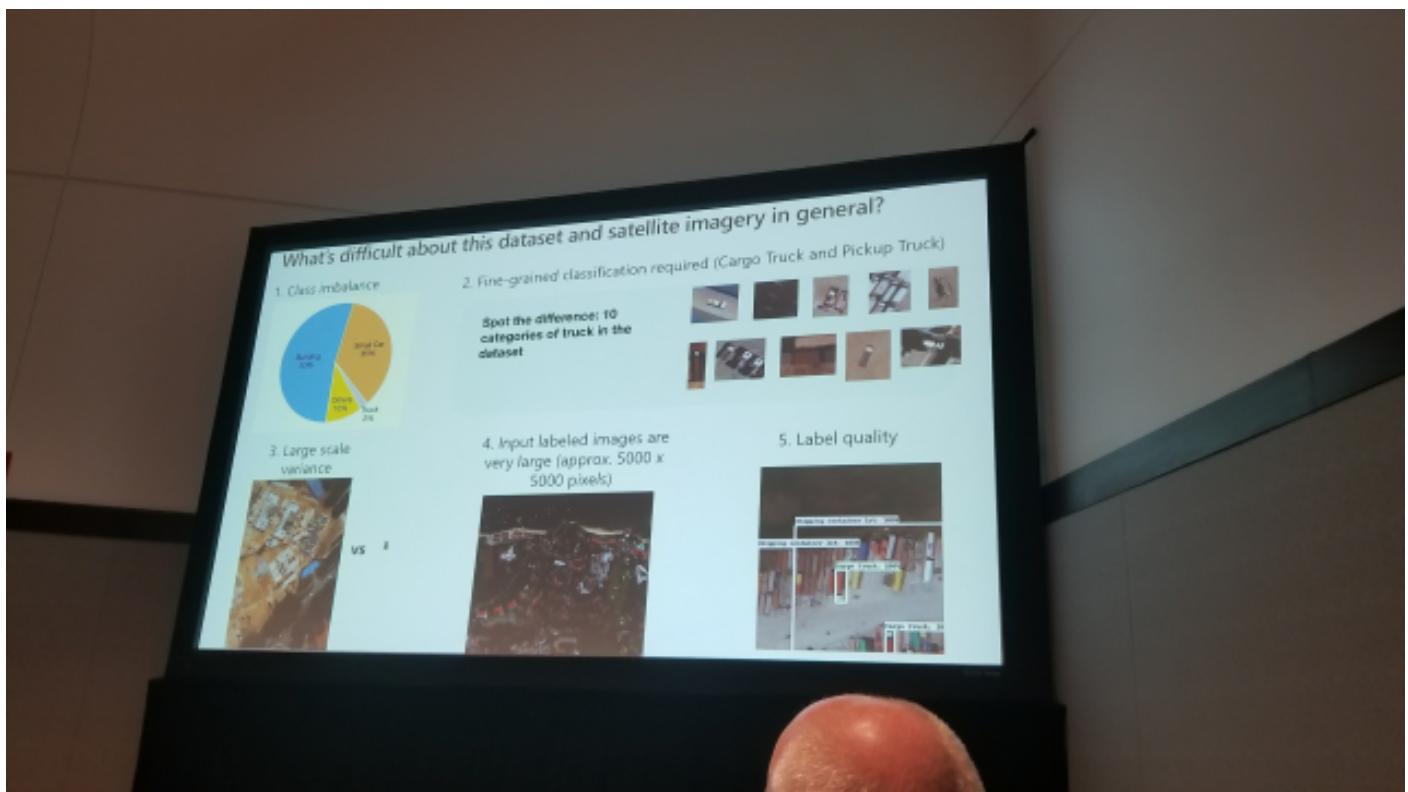
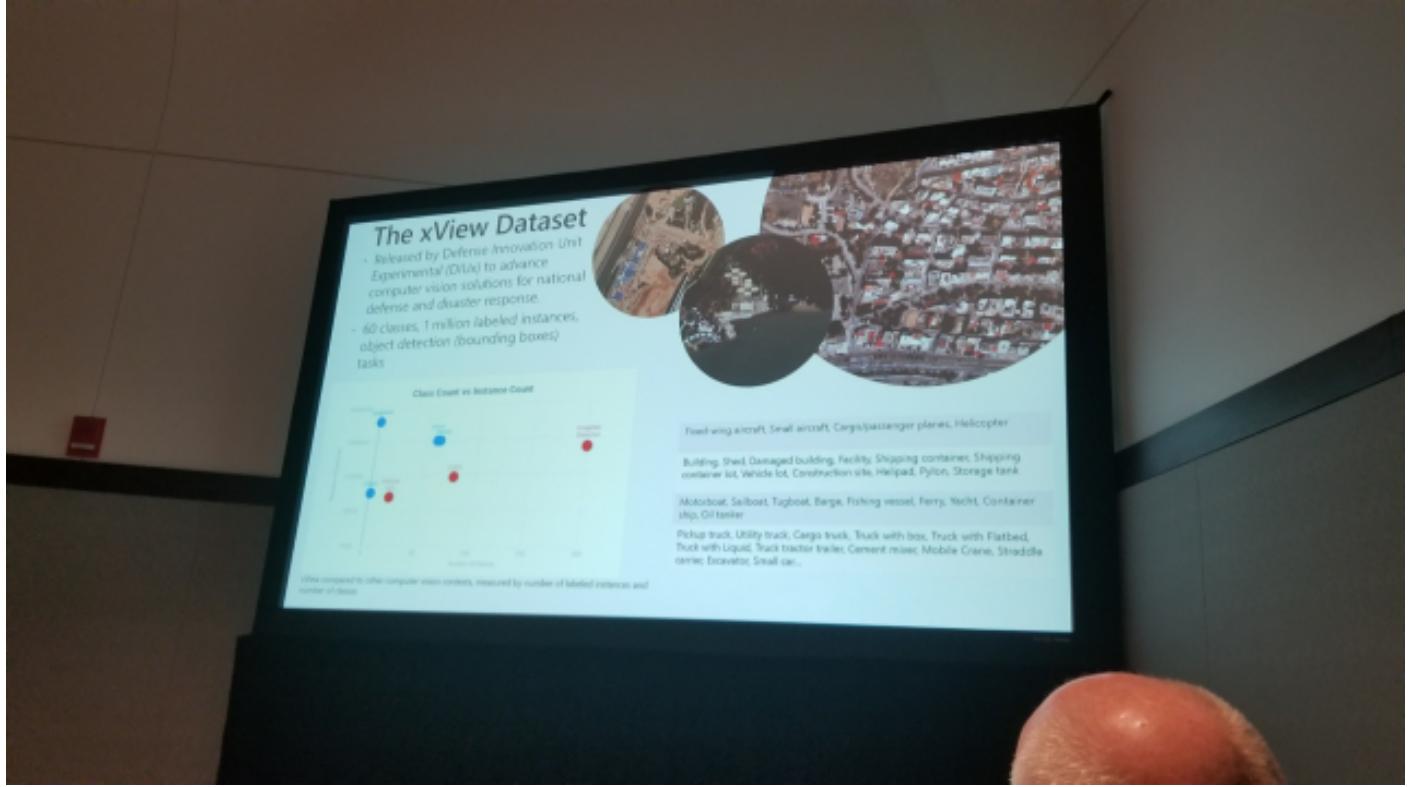
Satellite object detection

Object Detection - Satellite images

Problems

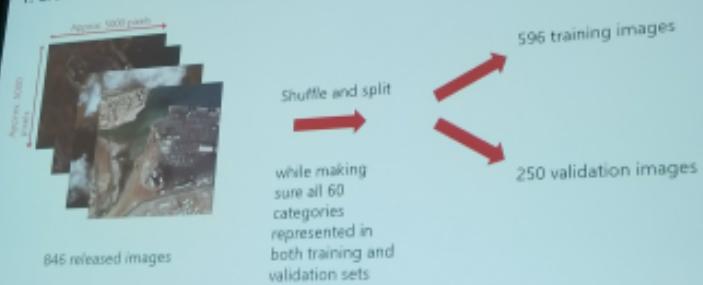
1. Class Ambiguity
2. Class Invariance \rightarrow SNP





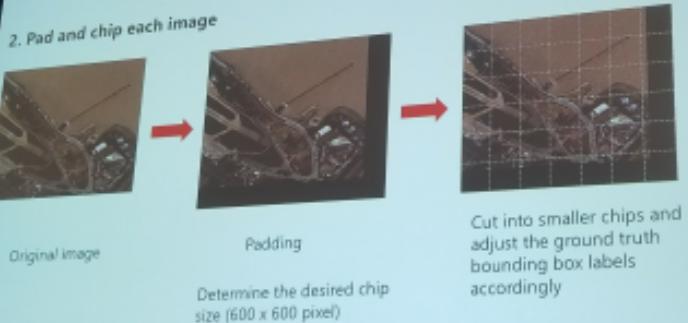
Workflow and methodology (1)

1. Create our training and validation splits (ratio 70:30)



Workflow and methodology (2)

2. Pad and chip each image





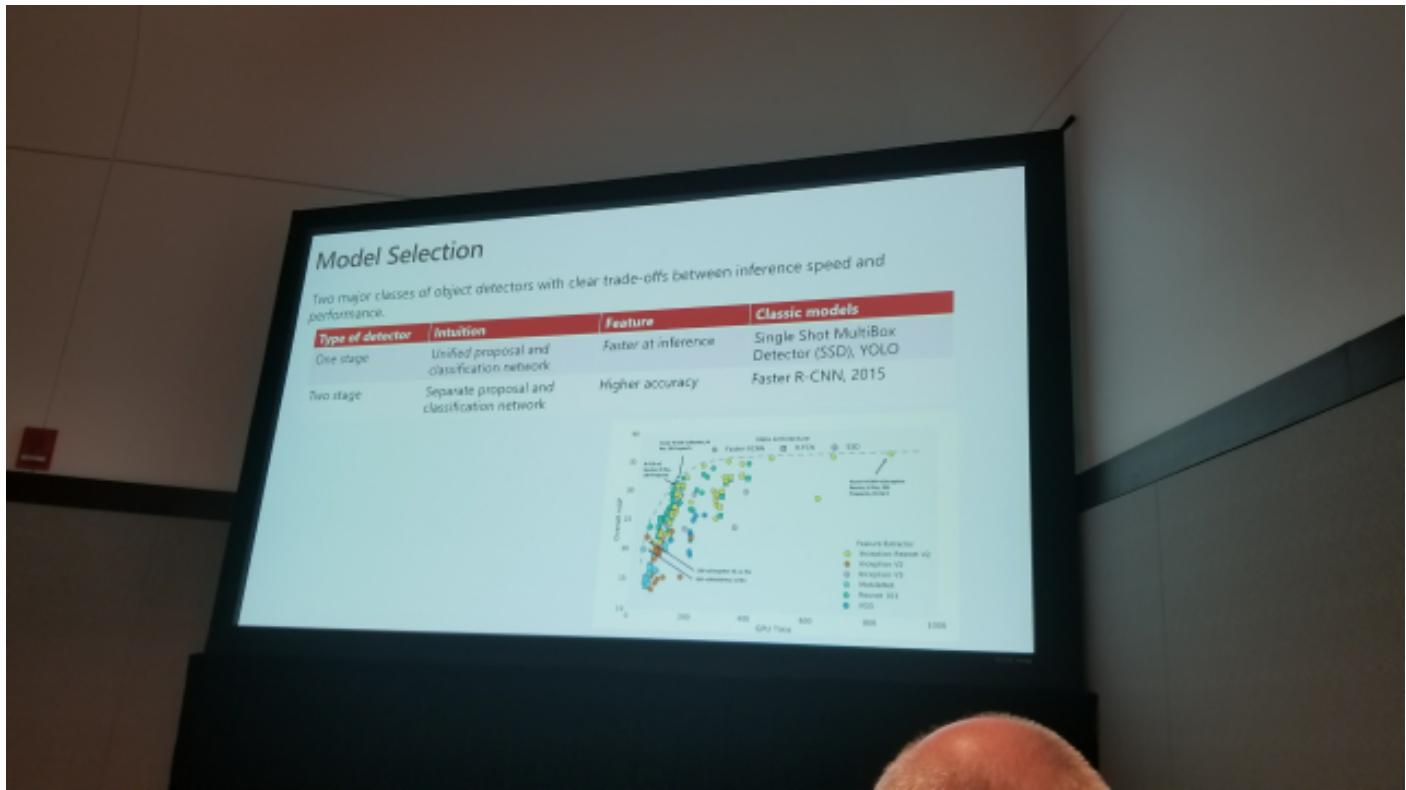
How effective is oversampling and undersampling as solutions to class imbalance?

	unbalanced	balanced 300
Std dev in percent of dataset	8.078%	6.328%
Chip level mAP	13.1%	19.8%

Standard deviation in these columns

Balance did improve
51.1% improvement in chip level mAP

	bbox_stats							
category_id	category_name	instance count	percent	balance 300 instance count	balance 300 instance count percent	balance 600 instance count	balance 600 instance count percent	ave_area
1	Fixed-wing Aircraft	74	0.012%	890	0.197%	700	0.099%	3409.24
2	Small Aircraft	368	0.061%	1317	0.292%	1499	0.212%	1497.15
3	Passenger/Cargo Plane	718	0.119%	2643	0.586%	2394	0.339%	13824.08
4	Helicopter	71	0.012%	500	0.111%	460	0.065%	1841.01
5	Passenger Vehicle	2954	0.491%	2177	0.483%	2750	0.389%	164.98
6	Small Car	211654	35.176%	165599	36.734%	259022	36.648%	167.82
7	Bus	6974	1.159%	7438	1.88%	—	—	—

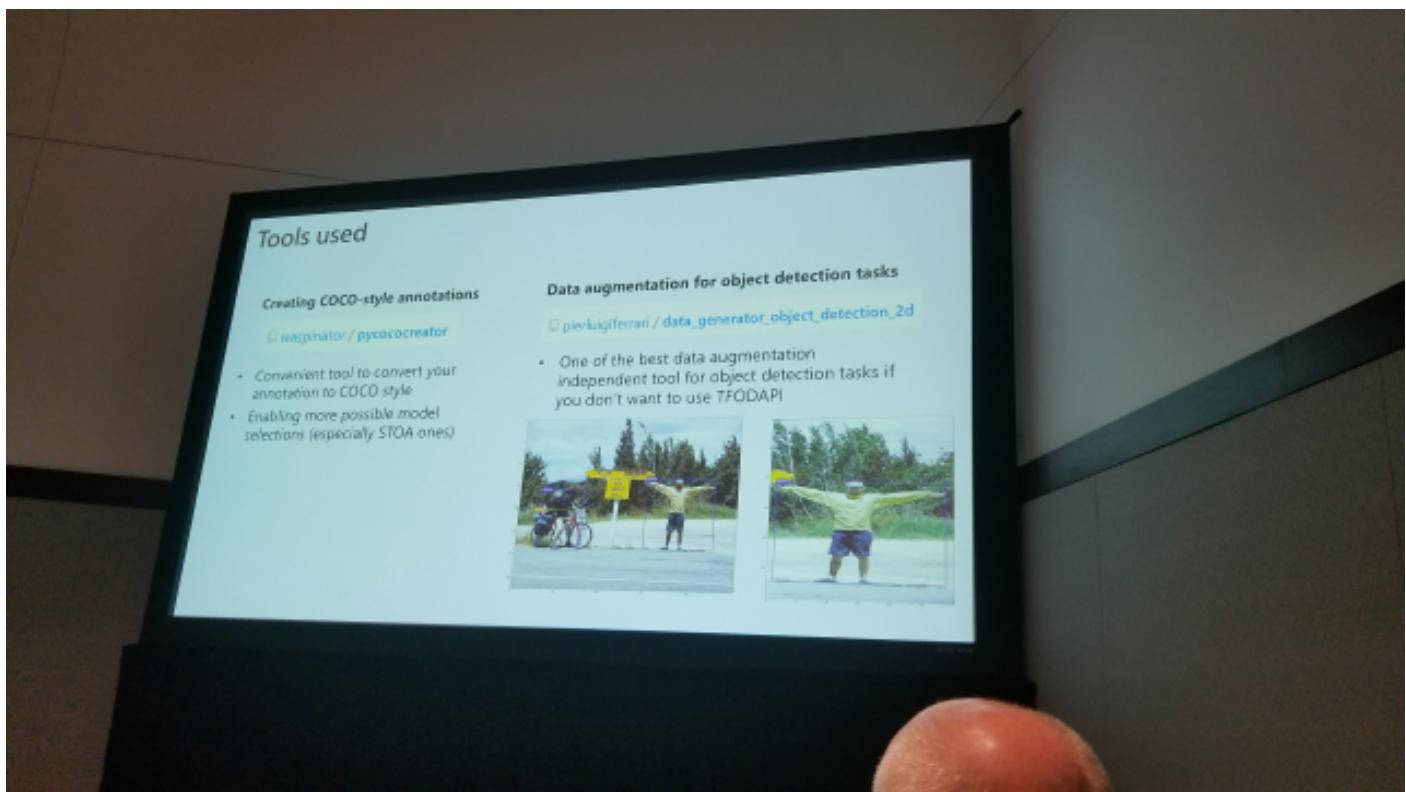
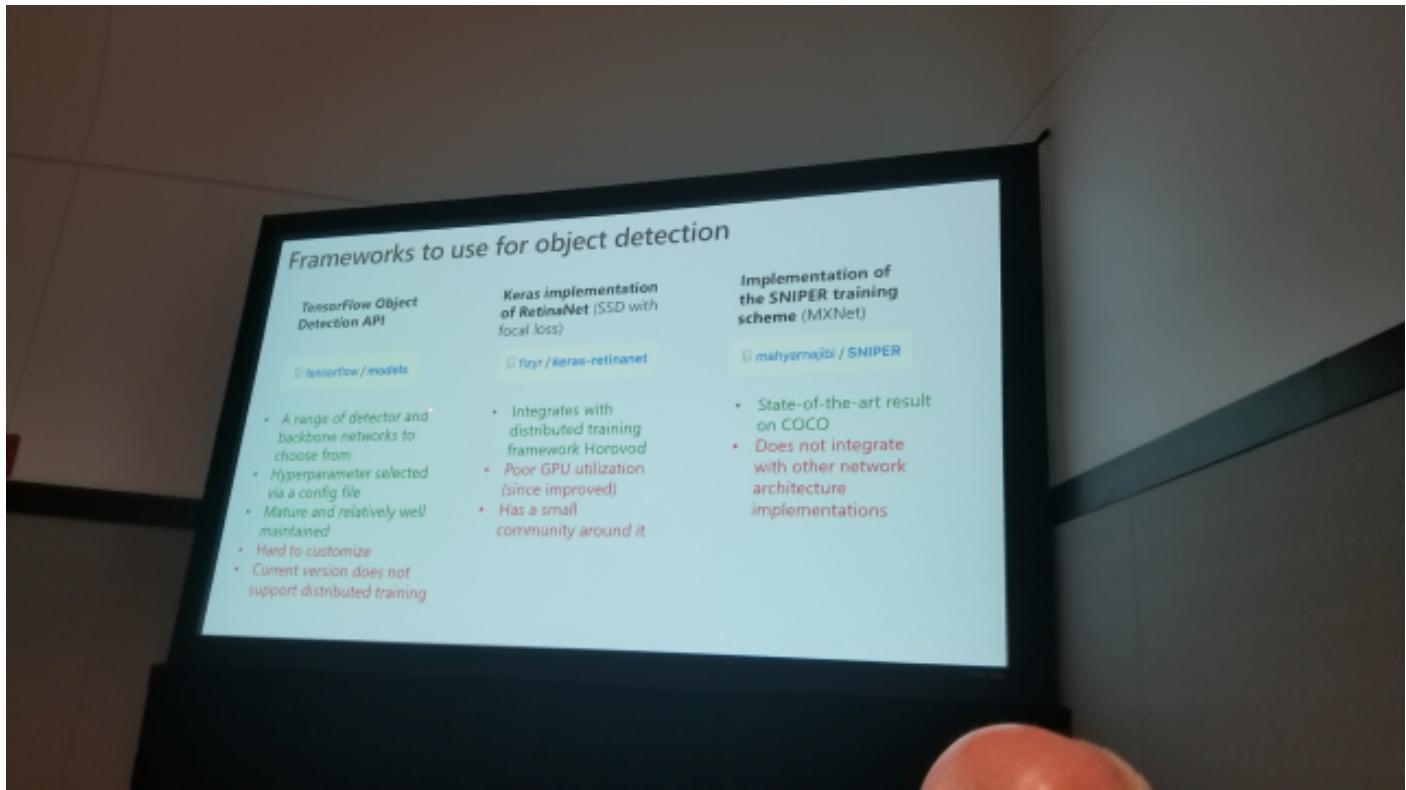


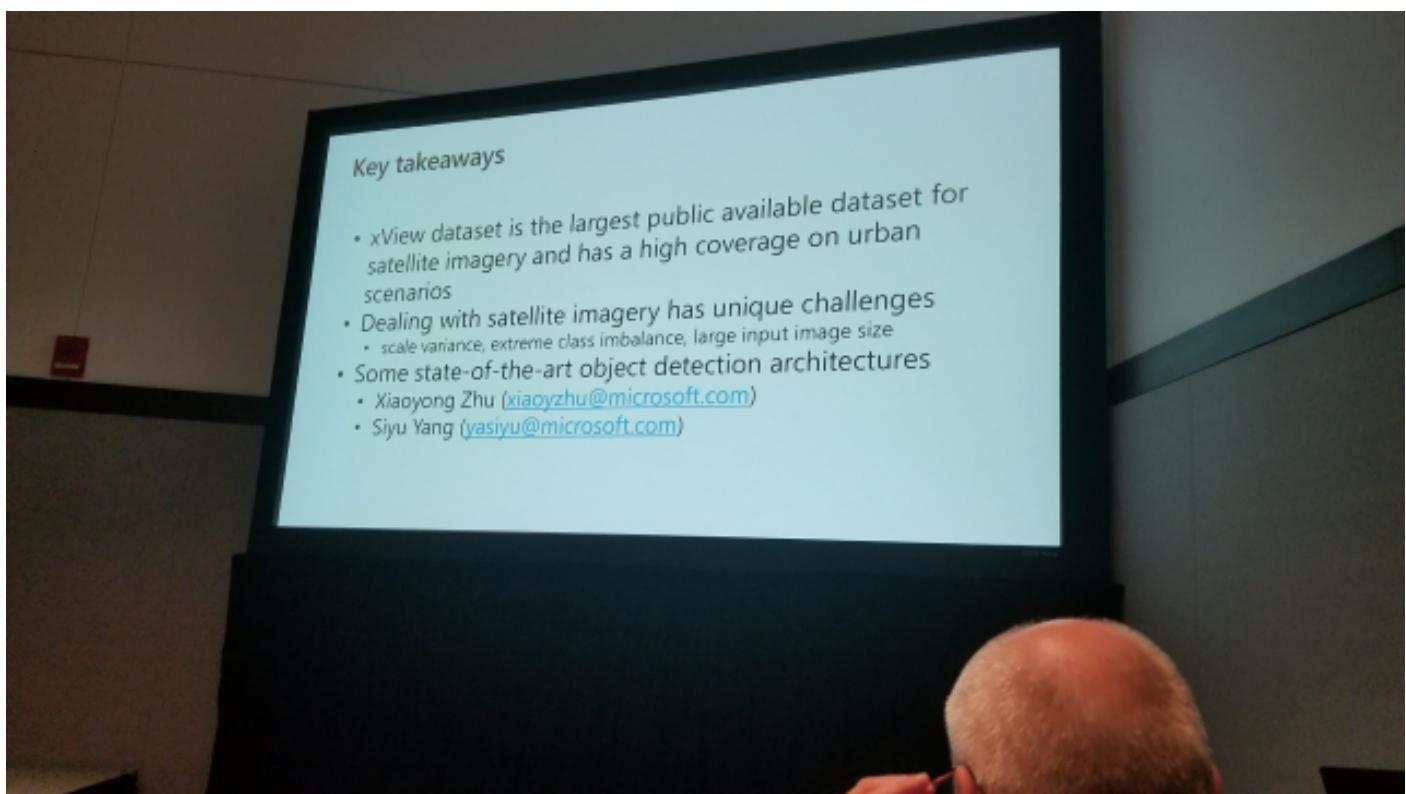
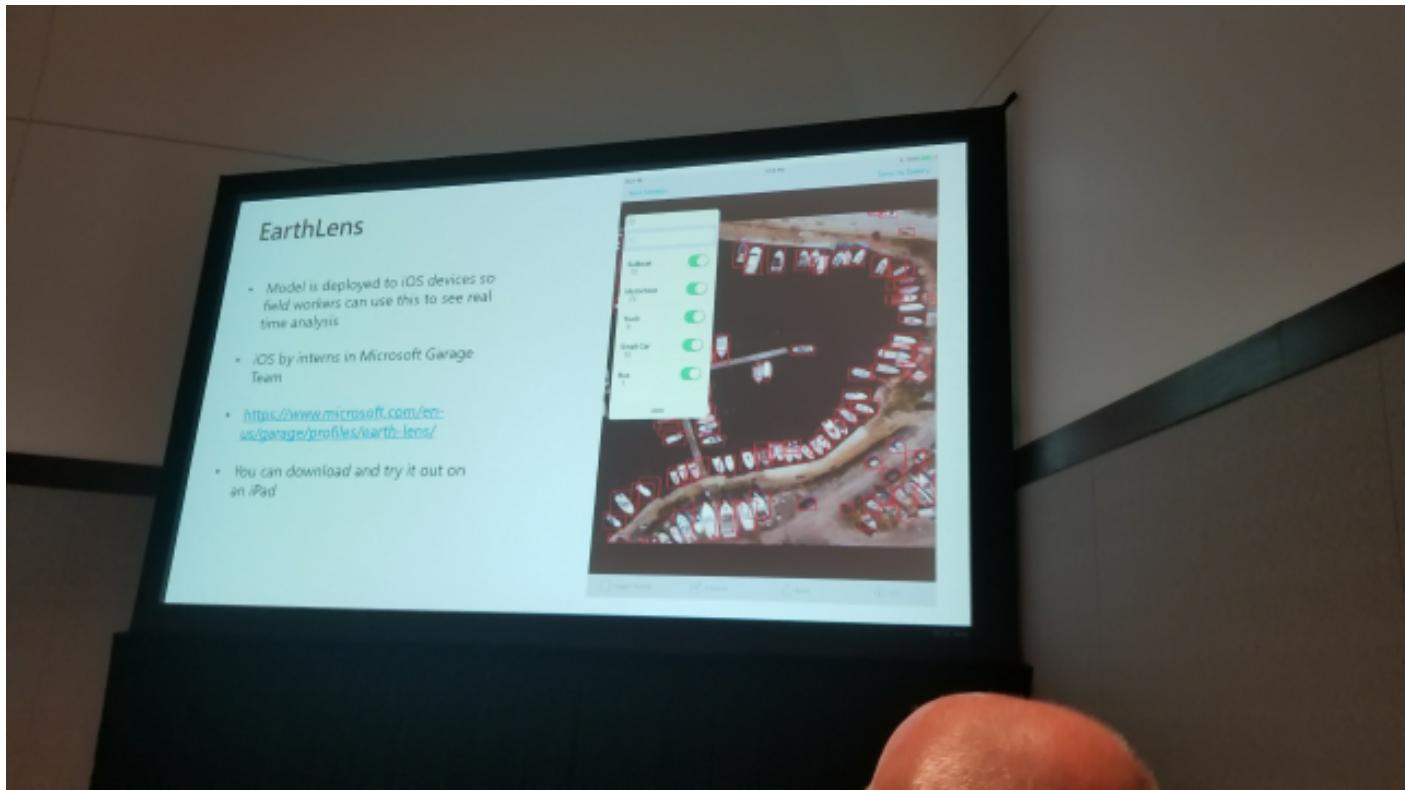
Results

Model Name	overall mAP	small mAP	medium mAP	large mAP
SSD + Inception v2	0.16	0.12	0.19	0.18
Faster R-CNN + FPN + Deformable Operators	0.19 (+18.75%)	0.17	0.22	0.21
SNIP/SNIPER (+ Data augmentation)	0.22 (+15.79%)	0.17	0.23	0.28

Architecture







Last modified: 11:02 PM