

DroneFace

An Open Dataset for Drone Research

<https://github.com/hjhsu/DroneFace>

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DroneFace, huh?

Faces Captured by Drones

A dataset composed of faces taken from specific distances and heights

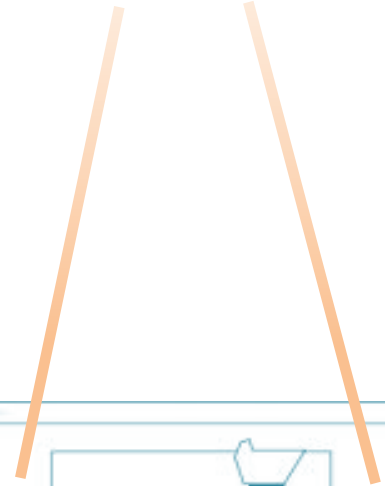
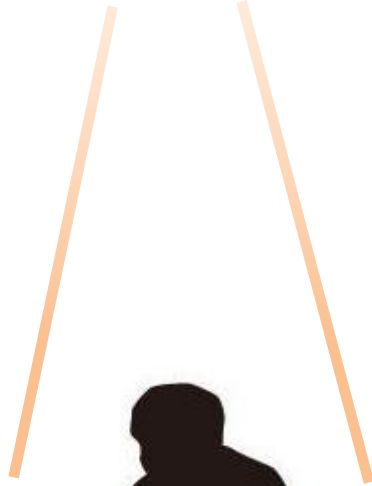
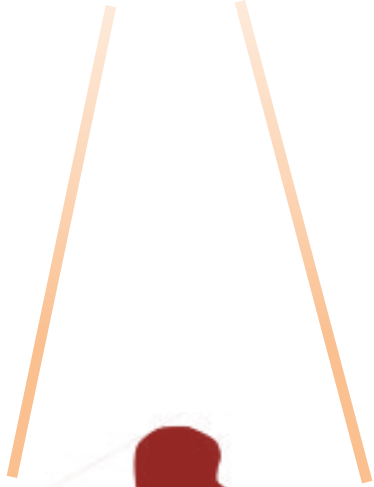
DroneFace: An Open Dataset for Drone Research

WHY DRONEFACE



<http://www.globalresearch.ca/us-government-targeted-second-american-citizen-for-assassination/5442842>





Why We Need DroneFace

- Testing how distances and angles influence face detection/recognition
- Evaluating how good face detection/recognition techniques work on drones

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WHAT IS INCLUDED IN DRONEFACE

Faces



D: 17m, H: 1.5m



D: 13m, H: 1.5m



D: 9m, H: 1.5m



D: 5m, H: 1.5m



D: 2m, H: 1.5m

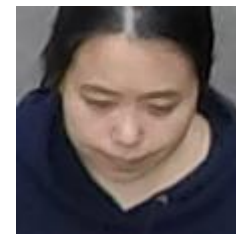
Easy for recognition



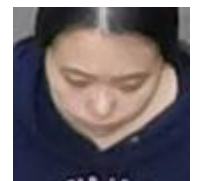
D: 4m, H: 1.5m



D: 4m, H: 3m



D: 4m, H: 4m

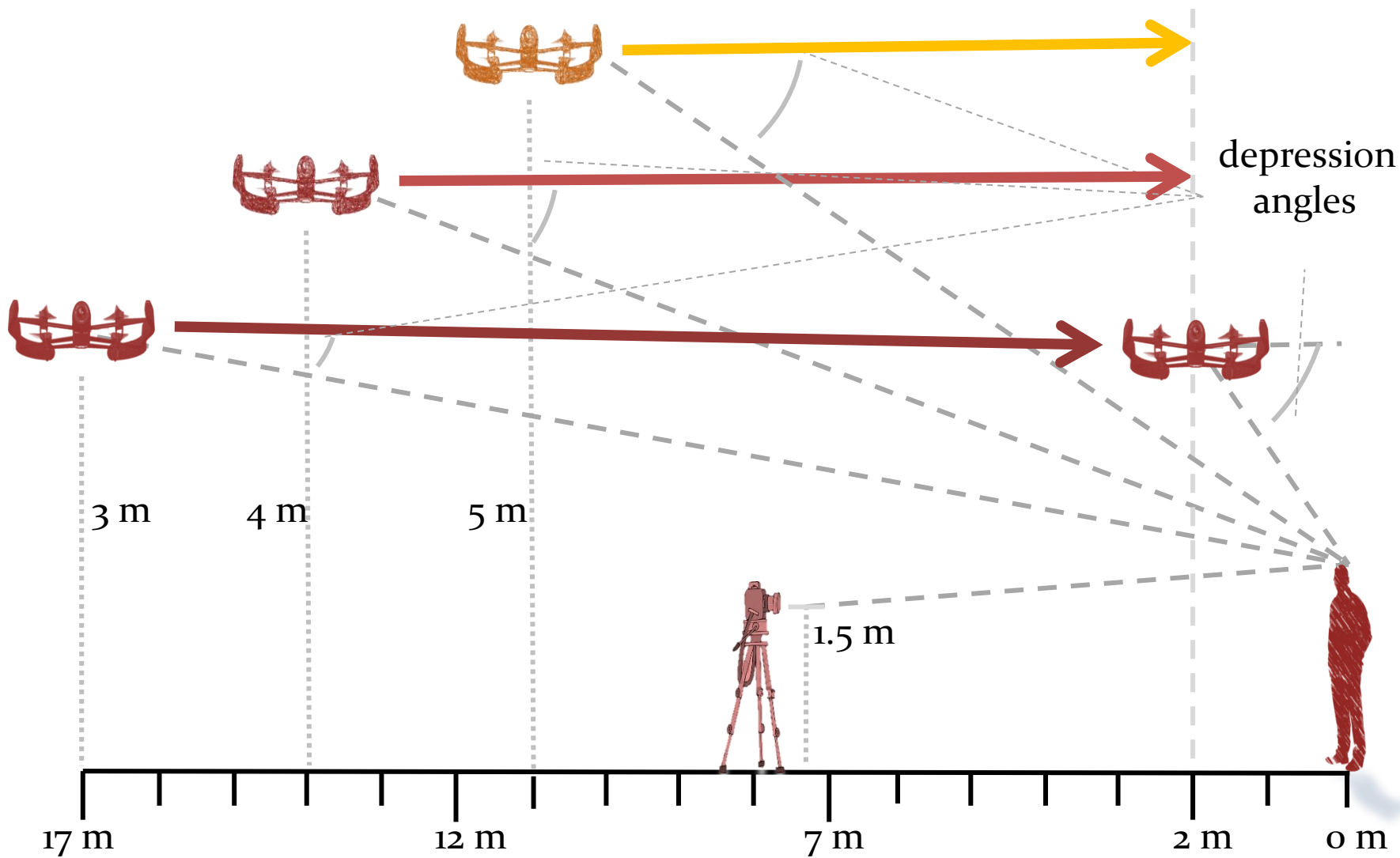


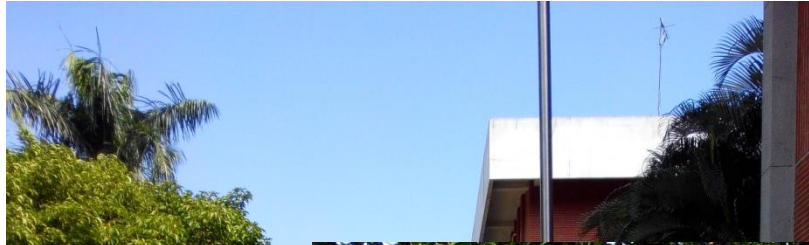
D: 4m, H: 5m

Difficult for recognition

Not Only Faces







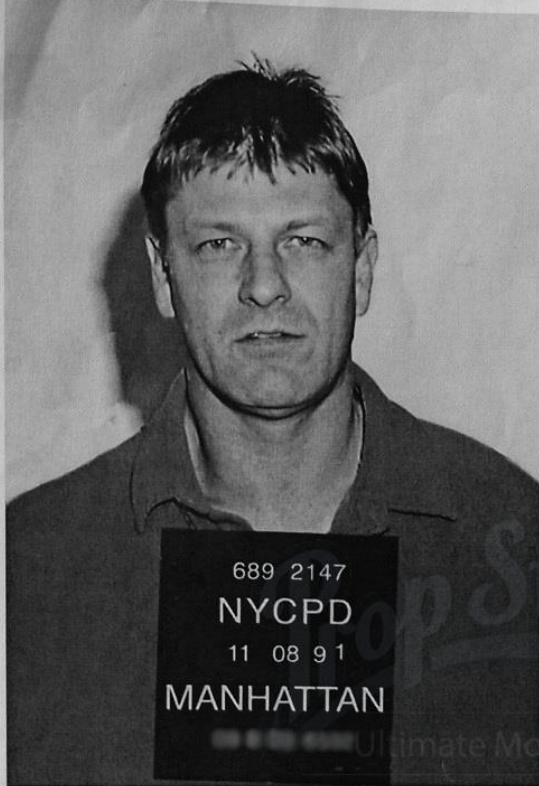
One More Thing...

- Pictures for building models
 - Portrait photos (frontal)



- Side-view portraits





Patrick Barry Koster

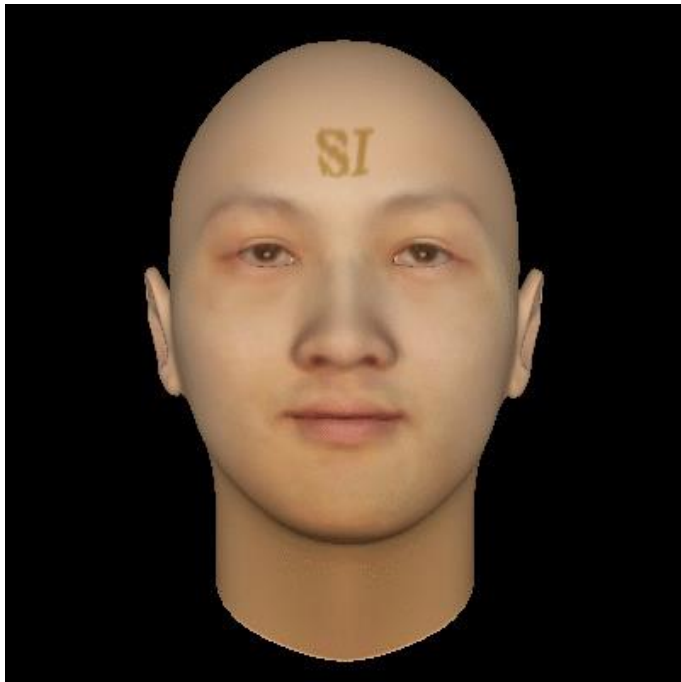
PHYSICAL DESCRIPTION		AKA: N/A	MR#: BK25364
Sex:	Male	DC# 36549201	FB# 026895423
Height:	5' 11"	NYSID#	CTS# 3654-95864-3695
Weight:	175 lb.	Criminal Record	
Build:	Medium	KOSTER has past for Assault and voluntary Manslaughter as well as being a suspect for several Armed Robbery cases. He is also a suspect in several Homicides since his release from prison.	
Hair:	Light Brown	Warning	
Eyes:	Blue	KOSTER is highly intelligent and unpredictable He is considered and extremely dangerous so approach with utmost caution and care.	
Comp:	Fair		
Race:	White Caucasian		
DOB:	06/10/61		
Marks/Scars: <small>Please give detailed description</small>	N/A		

<https://propstore.com/product/dont-say-a-word/patrick-koster-sean-bean-criminal-file-page/>

IDENTIFICATION & DATA SYSTEMS
 (Please furnish All additional criminal history on a separate sheet)
 Form - R879-23

3D Augmentation

- Using the frontal and side-view portraits to build 3D face model for augmenting face recognition in various angles



Dataset Summary

- 11 subjects including 7 males and 4 females.
- 2,057 pictures including 620 raw images, 1,364 frontal face images, and 73 portrait images (including frontal and side-view)
- Features for the raw images are taken with
 - 3,680x2,760 resolution with ultra-wide field of view (170°) under daylights
 - 1.5, 3, 4, and 5 meters high
 - 2 to 17 meters away from the subjects with 0.5 meters interval.

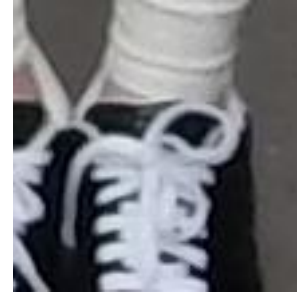
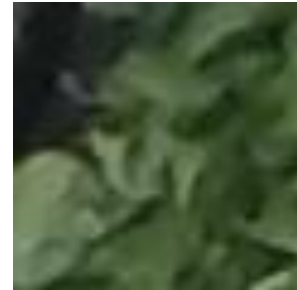
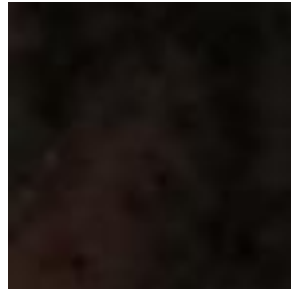
Comparison with Other Datasets

- <http://www.scface.org/>

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HOW TO APPLY DRONEFACE

Evaluation of Face Detection

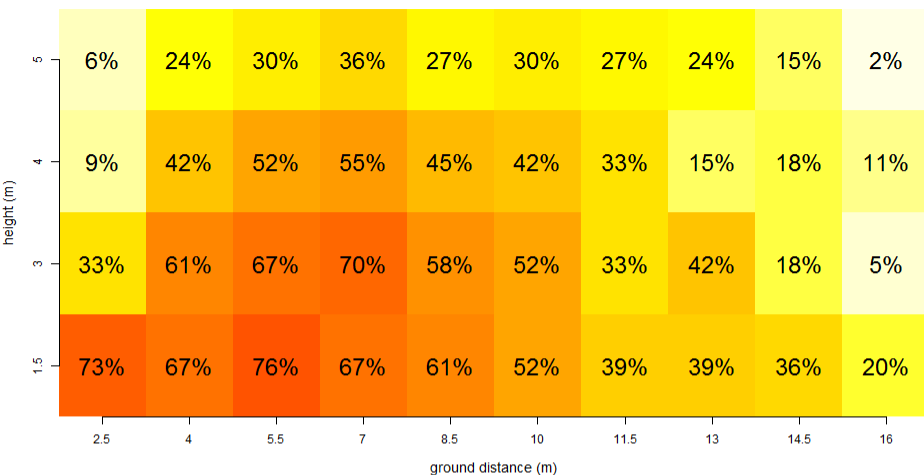


Evaluation of Face Detection on Drones

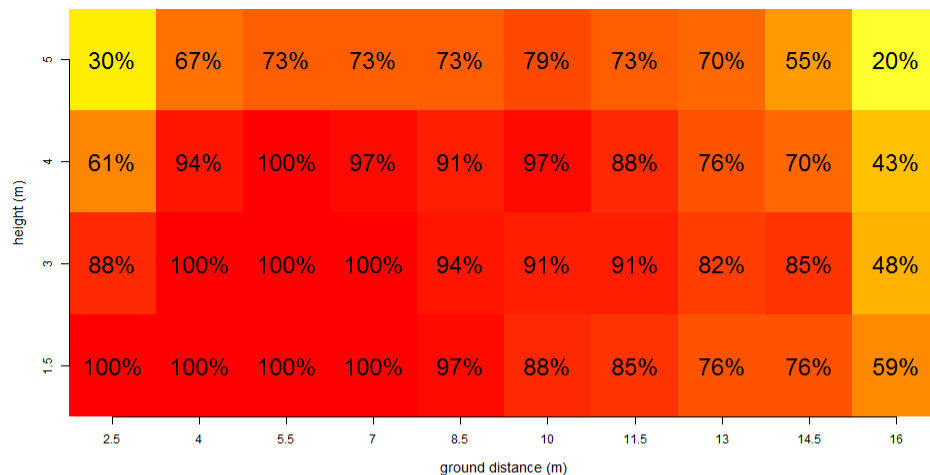
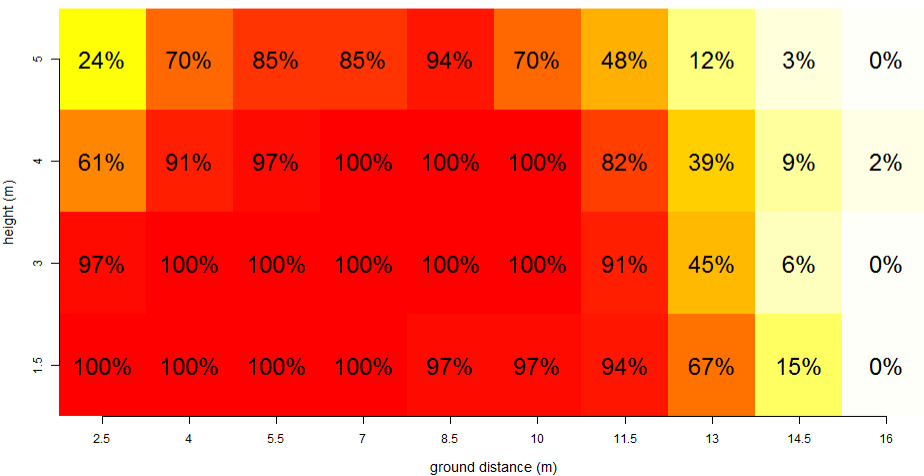
Method	# of faces	TPR	FPR
Face ⁺⁺	20	0.14	0.05
ReKognition API	37	0.27	0.13
Haar (default)	14,777	0.71	0.93
Haar (alt)	1,700	0.77	0.37
Haar (alt2)	2,545	0.78	0.57
Haar (alt tree)	510	0.37	0.002
LBP	2,964	0.63	0.70

Detecting 1,364 target faces from 620 raw images

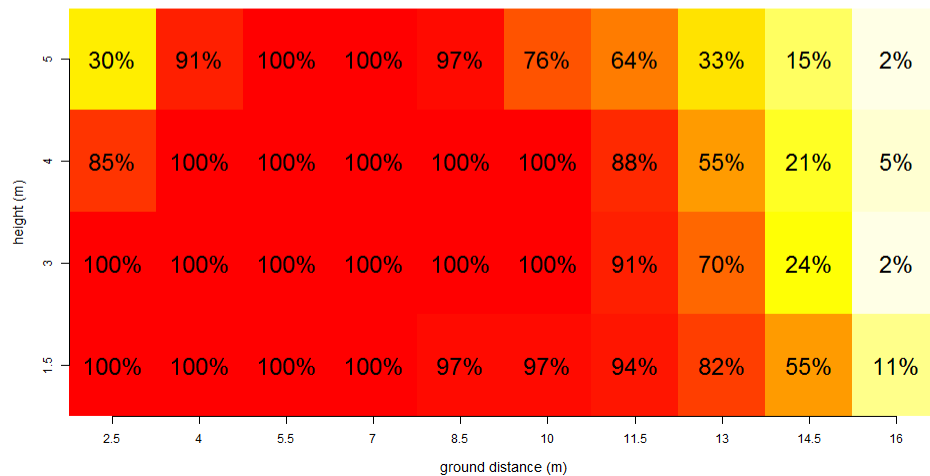
Haar (alt tree)



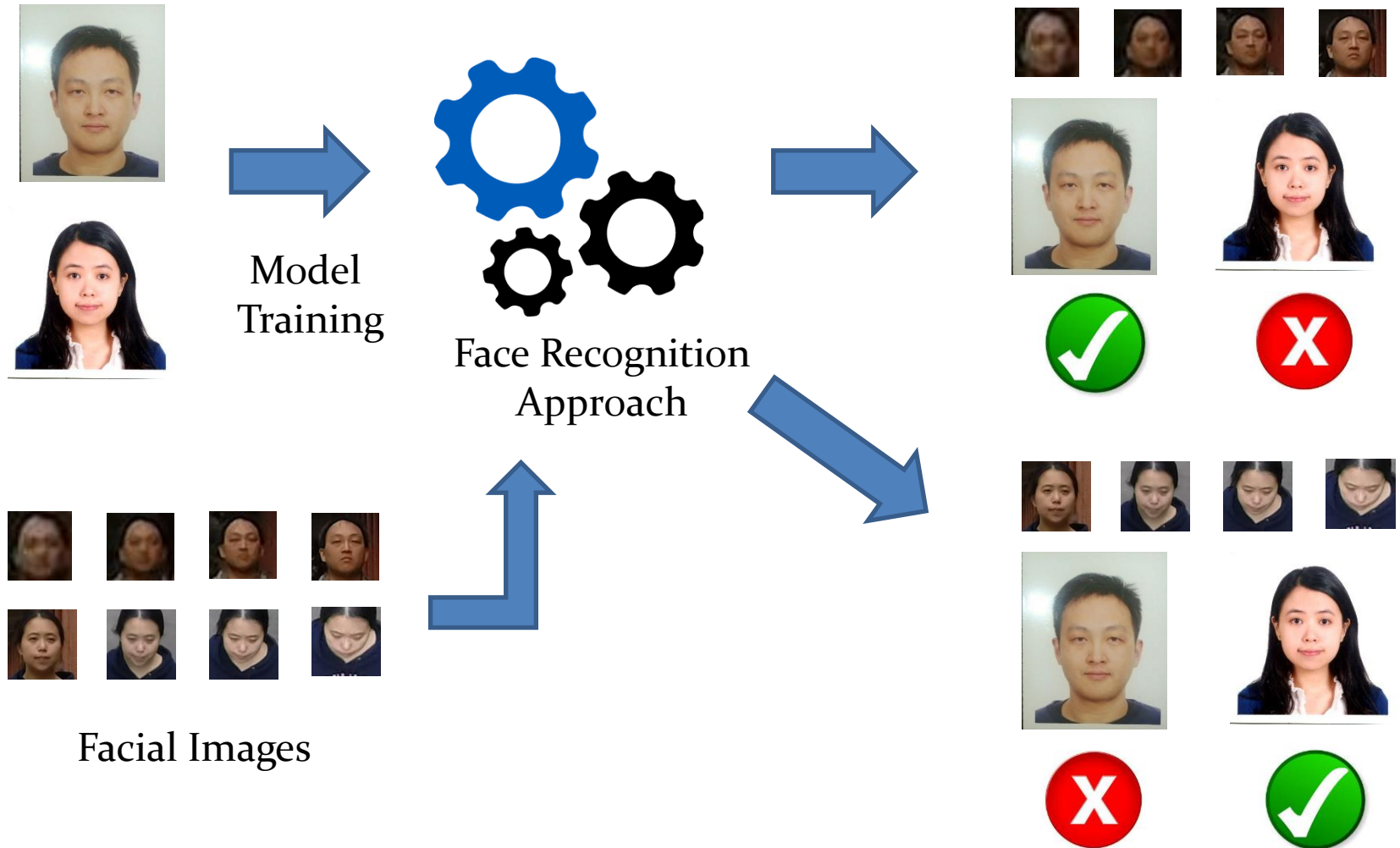
Haar (alt2)

Face⁺⁺ with pre-detection

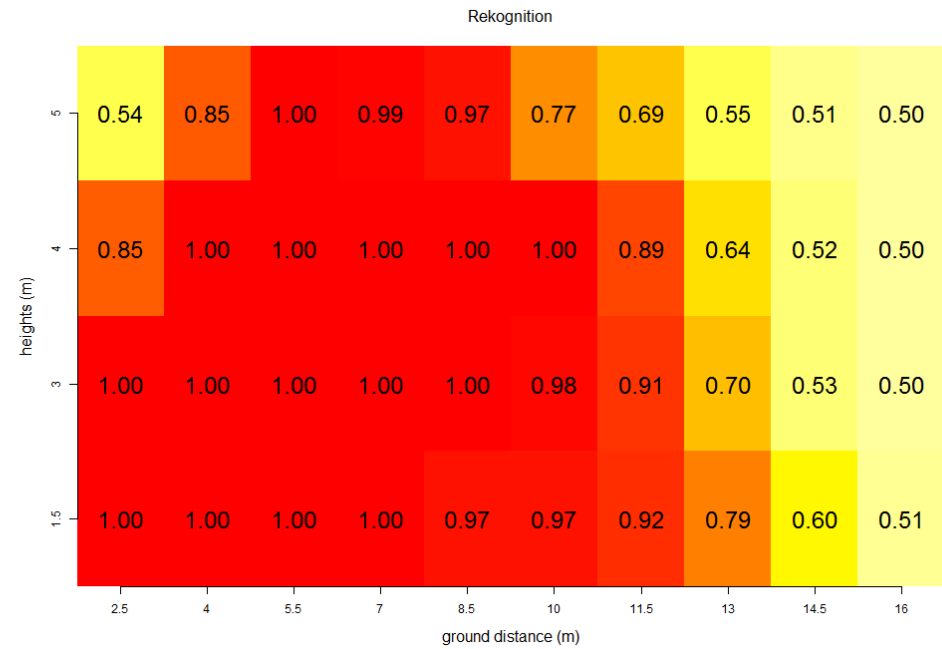
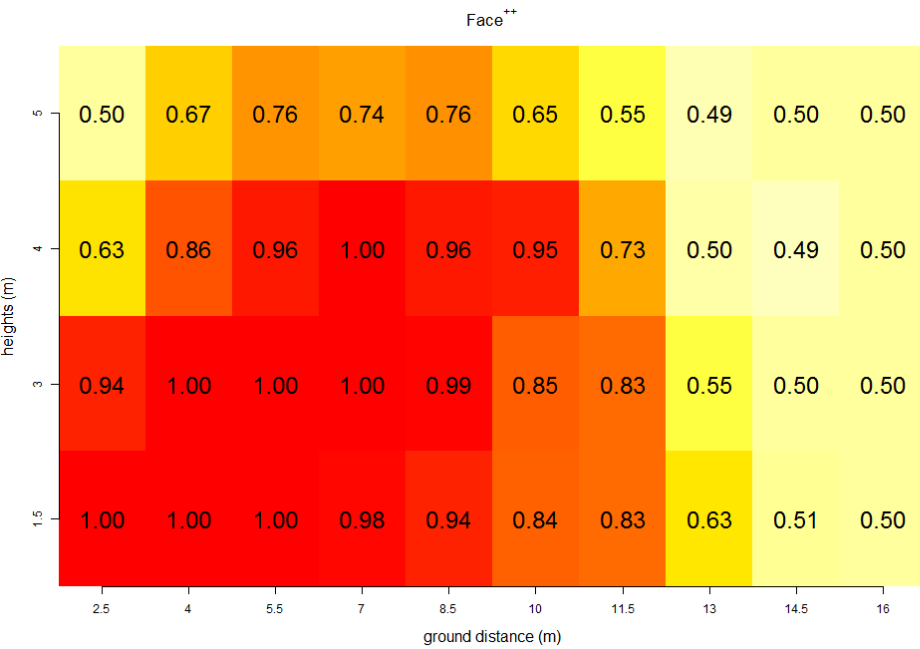
Recognition with pre-detection



Evaluation of Face Recognition



Evaluation of Face Recognition on Drones



Conclusion

- DroneFace: a dataset simulating taking pictures with drones
 - Pictures taken from specific distances and heights
- Evaluation of how good face detection/recognition methods can be applied on drones within real-world contexts
- ***<https://github.com/hjhsu/DroneFace>***

Thanks for your Attention

Q & A

