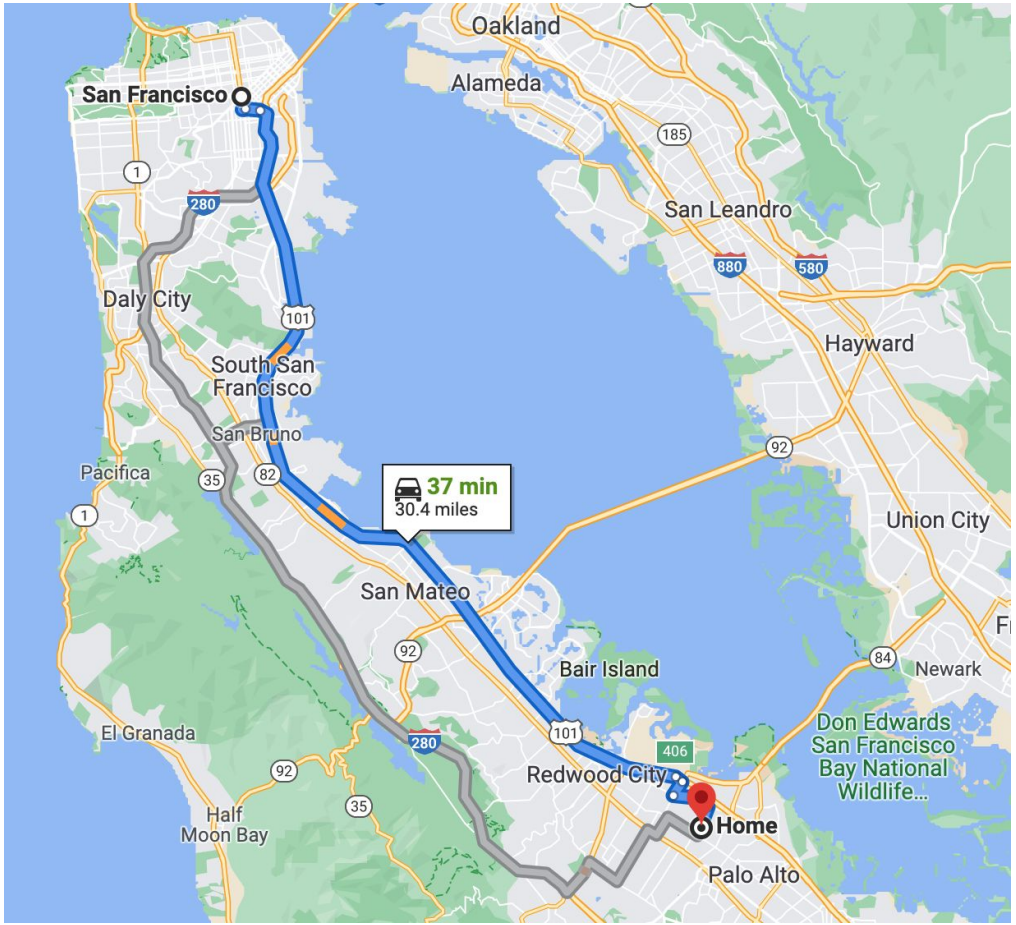
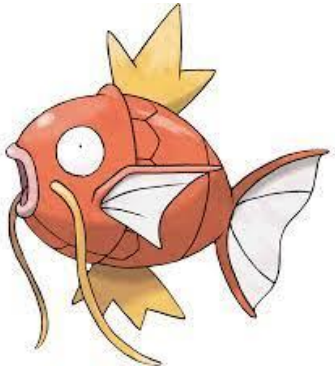
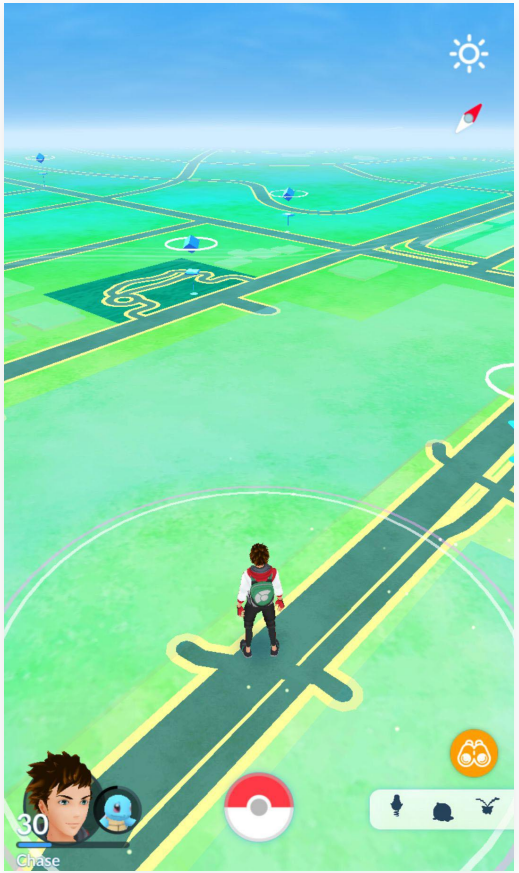
SCAVENGER
HUNT


Oakland
Alameda
San Francisco
185
1
280
San Leandro
880
580
Daly City
101
Hayward
South San Francisco
San Bruno
92
Pacifica
35
82
37 min
30.4 miles
1
Union City
San Mateo
92
Bair Island
84
Newark
El Granada
280
101
406
Don Edwards San Francisco Bay National Wildlife...
92
Redwood City
35
Half Moon Bay
Home
Palo Alto



Fisherman’s Wharf

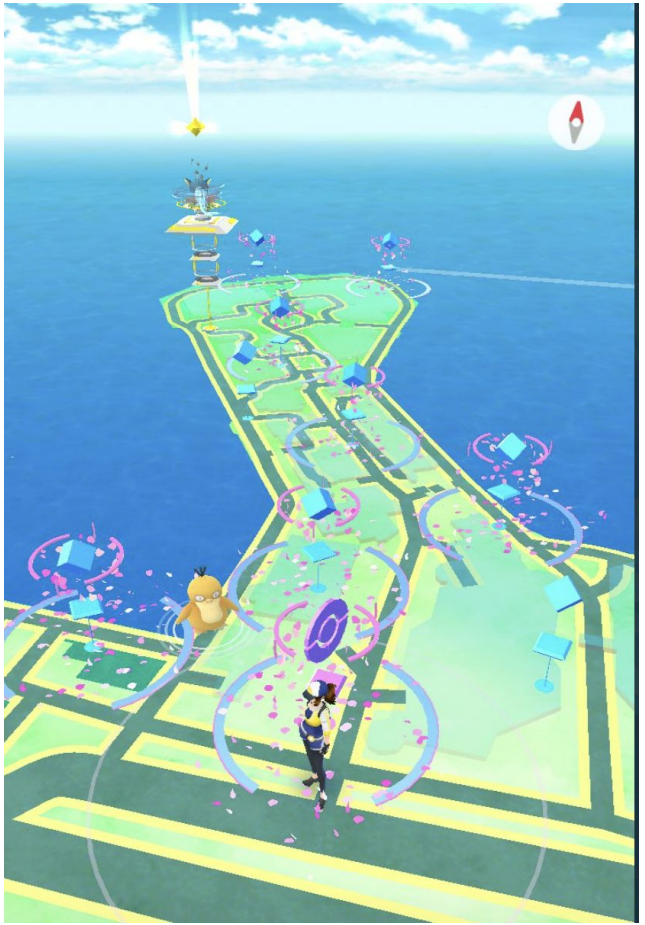
Pier 39


30
Chase

Magikarp
CP 30
15

Edward Jiang, Nathan Gage, Jonathan Ebrahimian

Scavenger Hunt

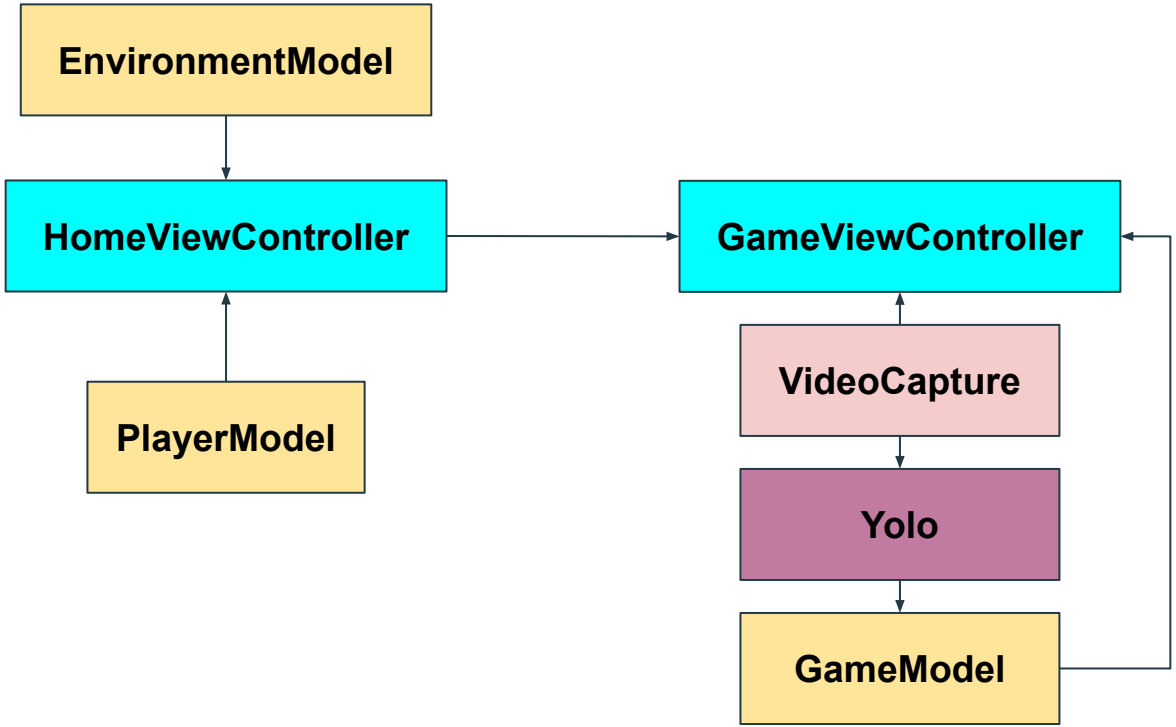


Scavenger Hunt

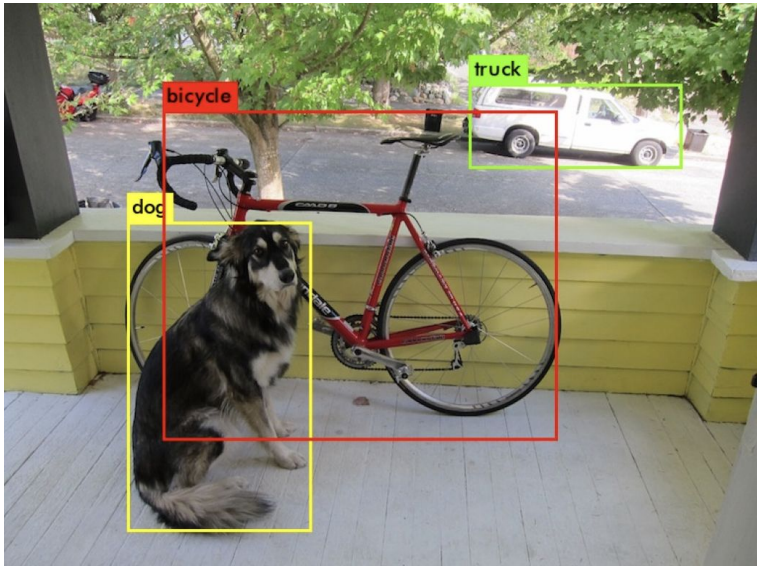
- Different difficulties for different rooms
- Rooms with different items to find
- Camera instead of AR

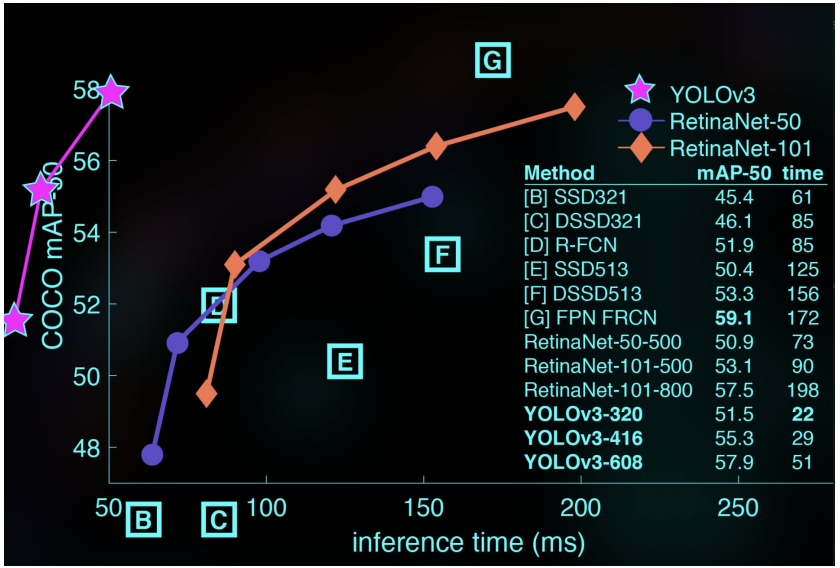
How does it work?

Design


EnvironmentModel
HomeViewController
PlayerModel
GameViewController
VideoCapture
Yolo
GameModel

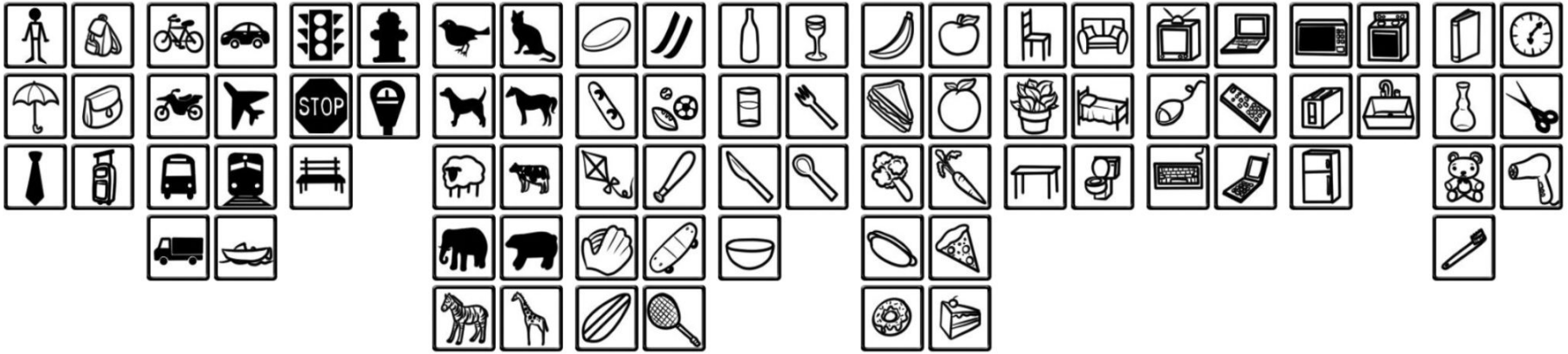
YOLO (You only look Once)





COCO (Common Objects In Context)

- Standard dataset for image classification
- 80 unique classes



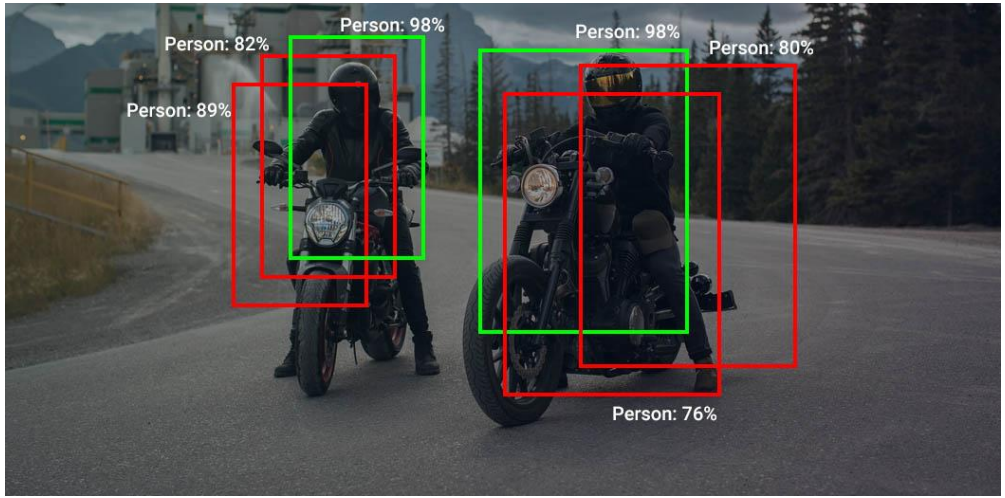
...but YOLO isn't Easy :(

Conversion from PyTorch to CoreML

- Pretrained weights (on COCO) are available
- Provided by YOLOv5 maintainer, Ultralytics
- **Unfriendly output**

NMS/Bounding Boxes

- Non-max Suppression
- YOLOv3 with existing NMS
  - Update & Fix Vision Implementation

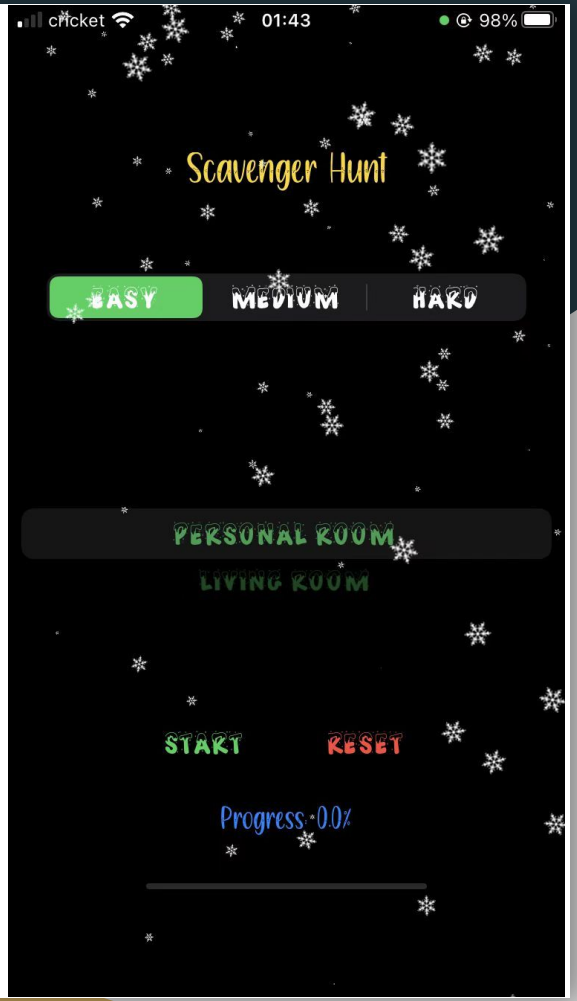


OUTPUTS

output1	name: **output1**
	type: **float64[255,13,13]**
	The 13x13 grid (Scale1)
output2	name: **output2**
	type: **float64[255,26,26]**
	The 26x26 grid (Scale2)
output3	name: **output3**
	type: **float64[255,52,52]**
	The 52x52 grid (Scale3)

User Interface Design

- Minimize the thinking users have to do
- Clear and consistent design
- Animation



Demo Time!

Image Sources

- https://commons.wikimedia.org/wiki/File:San_Francisco_Skyline_%E2%80%94_Twin_Peaks_(6959150108).jpg
- https://www.roadtraffic-technology.com/projects/golden-gate-bridge-san-francisco/
- https://en.wikipedia.org/wiki/Pok%C3%A9mon_Go
- https://bulbapedia.bulbagarden.net/wiki/Magikarp_(Pok%C3%A9mon)
- https://cocodataset.org/#explore
- https://pjreddie.com/darknet/yolo/
- https://www.smccvb.com/listing/pier-39/1020/
- https://videohive.net/item/aerial-view-of-pier-39-san-francisco/26108852
- https://pjreddie.com/darknet/yolo/
- https://pokemonletsgo.pokemon.com/en-us/pokemon-go/
- https://snacknation.com/blog/scavenger-hunt-ideas/
- https://twitter.com/KeikoQvQ/status/763524232575725568/photo/2
- https://pytorch.org/get-started/locally/
- https://developer.apple.com/news/?id=06052017c