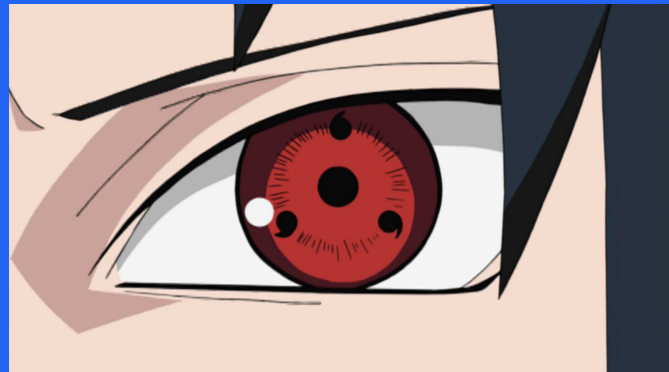


indeed

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Meh / 目 (め)

[Source code](#)



Jiayee

07 Aug 2020

## 29 Jul: Tiger Day



<https://www.worldwildlife.org/species/tiger>

## 10 Aug: Lion Day



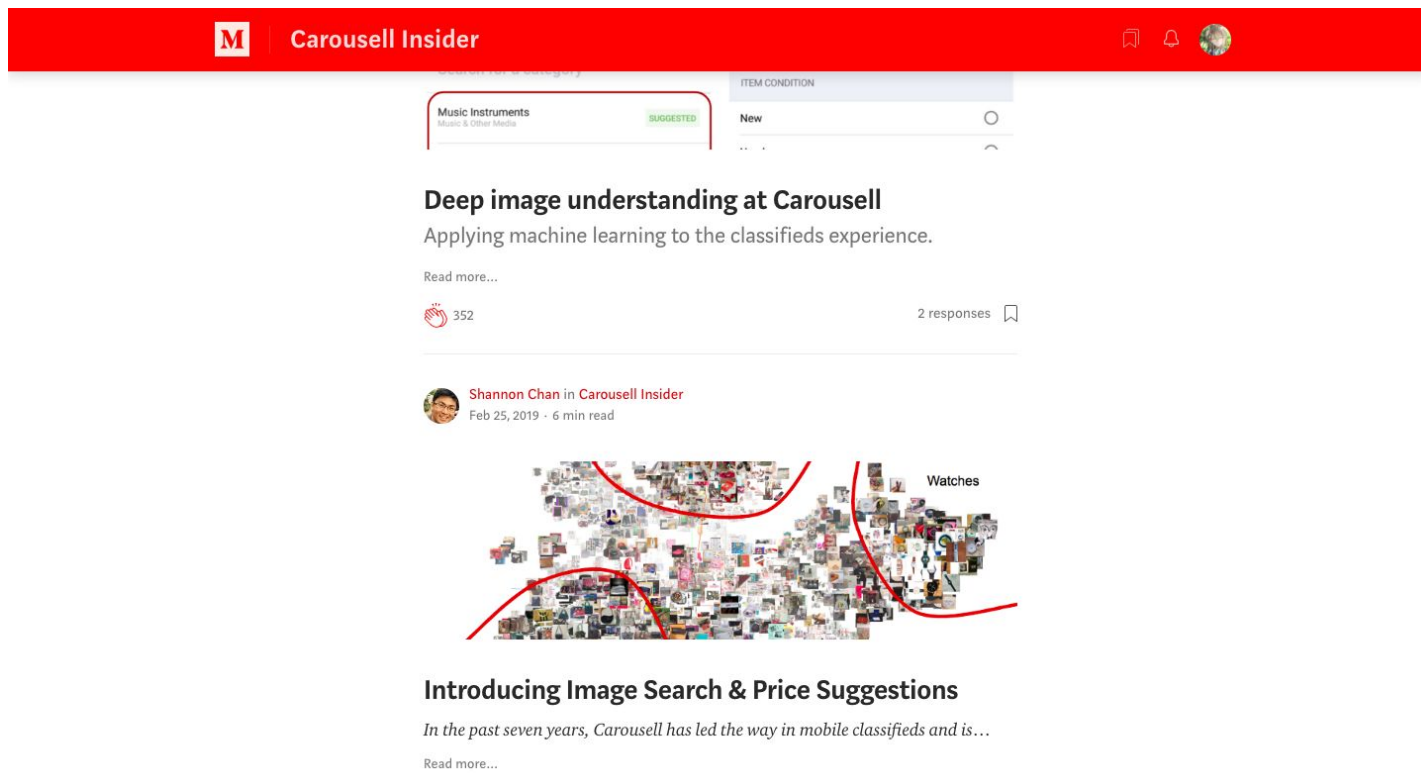
<https://en.wikipedia.org/wiki/Lion>

## Motivation: Combating illegal wildlife trade

- Convincing / pressuring governments to do ^
- Patrolling protected areas
- Donating to such causes on Good Deeds
- Joining the Cyber Spotting Program

So far, Coalition Cyber **Spotters** in the U.S., Germany and Singapore have **flagged** over 4,000 prohibited listings for sale **online**. ... Through the program, Cyber Spotters have helped uncover **new seller keywords** and **identify wildlife trafficking trends** that have helped companies' ongoing monitoring efforts. (Source: [ifaw](#))

# Focus: Carousell and Shopee



Already done  
but not  
publicised

Already WIP

Not in immediate  
plans yet

Not feasible

## The (East Coast) Plan

1. Prepare a set of search terms to search the sites with. (Manual)
2. Crawl for product listings and their images. (Auto)
3. Feed the images into a Tiger object detection AI. (Auto)
4. Review product listings flagged by the AI and flag where appropriate. (Manual)

Search term is “tiger”

Crawl Carousell and Shopee

Object detection AI is [Darknet YOLOv3](#) with a pre-trained model

## Crawling (Shopee)

- Front-end client which pings the back-end API for data
- I used Scrapy to ping the back-end server directly and processed the JSON.
- I could not retrieve the product image until I query for the individual product.

(The thumbnail URLs contained **abc123<def456>\_tn** where **<def456>** was only known at the individual product page.)

<input type="checkbox"/>	?by=relevancy...	htt...	200	fet...	bundle...	19...	3...		
<input type="checkbox"/>	Good post 1	htt...	200	fet...	bundle...	1...	3...		
	https://shopee.sg/api/v2/search_items/?by=relevancy&keyword=tiger&limit=50&newest=0&order=desc&page_type=search&version=2								
<input type="checkbox"/>	?keyword=tige...	htt...	200	fet...	bundle...	1....	3...		

## Crawling (Carousell)

- Front-end client with server-side rendering at first load.
- Redux state was stored in `window.initialState`. I parsed that.
- API calls were made to fetch more product listings when the “Load more” button was clicked.

▼ Request Payload [view source](#)

```
{count: 22, countryId: "1880251", filters: [], isFreeItems: false, locale: "en", prefill: {}, query: "tiger", searchContext: "1202081622020a0032070a0574696765", session: "eyJhZ2dyZWdhdGVfY291bnQiojIyLCJjb250ZW!"}
```

## False positive(s) but that is okay

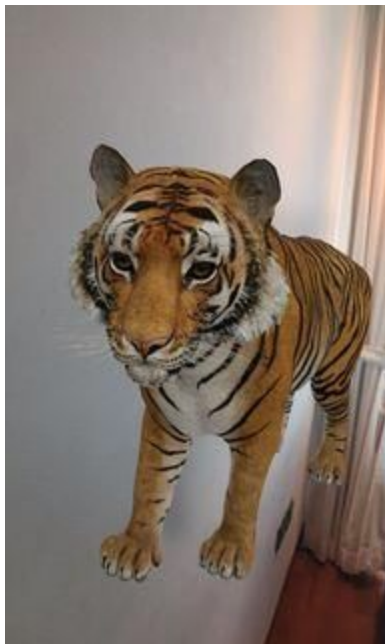
53.58%: tiger cat

46.08%: tiger

0.13%: tabby

0.02%: Egyptian cat

0.02%: jaguar





## Another interesting example

- 18.27%: shield
- 17.26%: tiger cat
- 7.96%: buckle
- 6.96%: tiger
- 3.02%: comic book



## Darknet YOLOv3

- A very different way of doing object detection

There is no pre-processing of images into components and training on many components. Whole images get fed into the neural network.

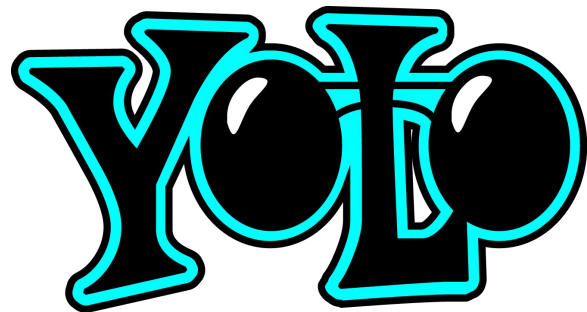
And in one of YOLO's tests, YOLO drew ~100 bounding boxes whereas RNN drew ~2,000 bounding boxes.

- The pretrained model can classify the following entities, including tigers.

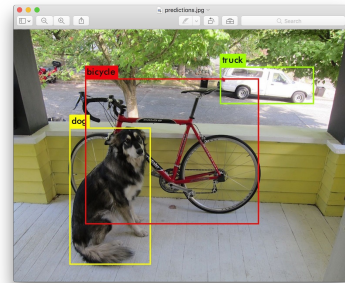


## Why YOLOv3?

- Pre-trained models meet the basic requirement of detecting “tigers”
- Well-documented for users
- Runs fast
- Sufficiently precise (at least, for the hackathon, for sure)
- Short and sweet papers



## What else did I learn from using YOLOv3?



- I learnt about YOLO itself
  - Brief idea on some of the popular object detection AI mentioned by YOLO papers
  - Various object detection data sets and how to understand them
  - Brief idea on some of the algorithms, processes, metrics used by objection detection AI
- E.g. Selective search algorithm (which itself uses image segmentation), non-maximum suppression (NMS), co-adaptation in neural networks, mean average precision (mAP)
- Refresher on the wonders of conditional probability
  - Refresher on the horrors of long loss functions

## Possible future directions

- Work with ecommerce and any other relevant platforms on whether this methodology is feasible
- Collect images of seized animals and illegal animal products
- Train object detection models on more specific subjects.

Pangolin and other poor things ):

Caged animals

Illegal animal products like ivory, tiger pelt

- Study more object detection frameworks and re-evaluate the decision of using YOLO
- I suggested to WWF the possibility of using technology to help out with cyber spotting

## Big thank you to:

- Python and Scrapy for easing quick prototyping
- Darknet YOLOv3 for being such an enabler
- GARNiDELiA for being my caffeine
- You! For your patience and attention
- And I owe apologies to Carousell and Shopee for the very minor surge in requests...
- Donate / Volunteer / Opt for more eco-friendly options to contribute to the conservation of wildlife! Happy National Day and Happy Lion Day!

