

# Chris Sulfrian

## Capstone 2 : Lemon Defect Detection

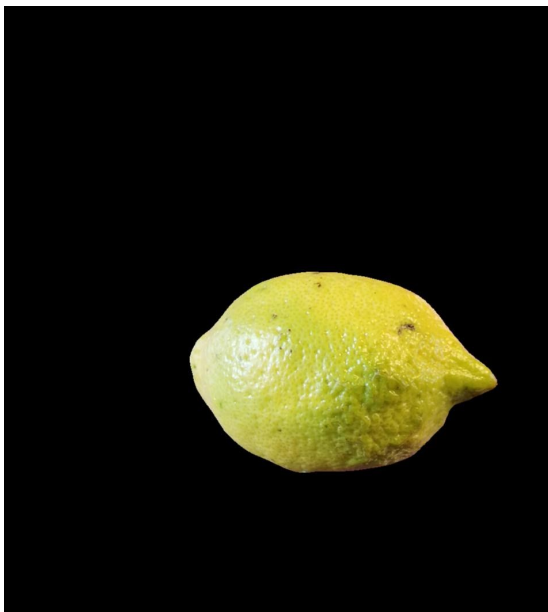
### Question

How accurately am I able to classify defects that may make a lemon unattractive to a consumer or unfit for human consumption? A consumer has a higher visual standard than a company who only cares if the guts are in good shape. If lemons can be thoroughly sorted before being distributed to retail grocery stores or food product companies, the amount of waste can be minimized.

My Data - <https://github.com/softwaremill/lemon-dataset>

I came across a new (3 weeks old) dataset of almost 2700 photos of lemons, in various orientations and states of disrepair. Those are accompanied by a .json annotations file that classifies the lemons into 9 different categories - some as booleans, some with segmentations describing areas of specific defects. For Capstone 2 I will be reducing those segmentations into boolean values so as not to bite off more than I can chew.

### Typical lemon photo



### Single annotation entry

```
{'id': 4,
 'iscrowd': 0,
 'area': 30.0,
 'category_id': 5,
 'image_id': 100,
 'segmentation': [[311.98046875,
 494.6767578125,
 308.92625953626884,
 496.7767247414795,
 309.8807842578408,
 500.21301373913593,
 311.2171188680404,
 501.3584434050208,
 314.0806930327544,
 500.78572857207837,
 315.2261226986393,
 498.68577418462155,
 315.03521775432455,
 496.0131049642223]],
 'bbox': [308.92625953626884,
 494.6767578125,
 6.299863162370457,
 6.681685592520807]},
```

### The nine categories

name	
id	
1	image_quality
2	illness
3	gangrene
4	mould
5	blemish
6	dark_style_remains
7	artifact
8	condition
9	pedicel

### Minimum Viable Product

The goal for capstone 2 is to develop a model that predicts with at least 75% accuracy between three baseline categorizations: consumer grade, institutional grade, and non-edible. I would like to compare various pre-processing techniques

### MVP+, ++

Compare different CNNs for their accuracies and speed on test data.  
Go buy some lemons, take photos, test it out, try not to eat crow!  
Add moar food puns.