

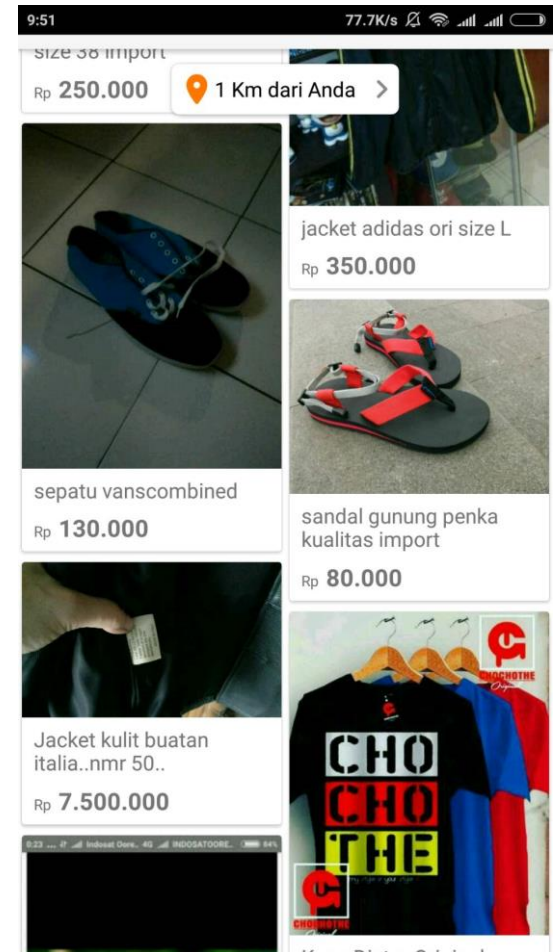
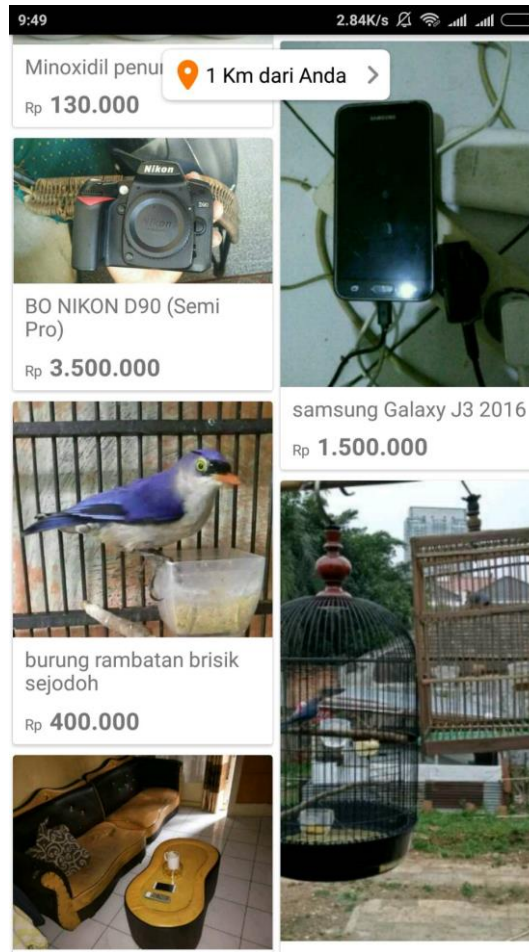
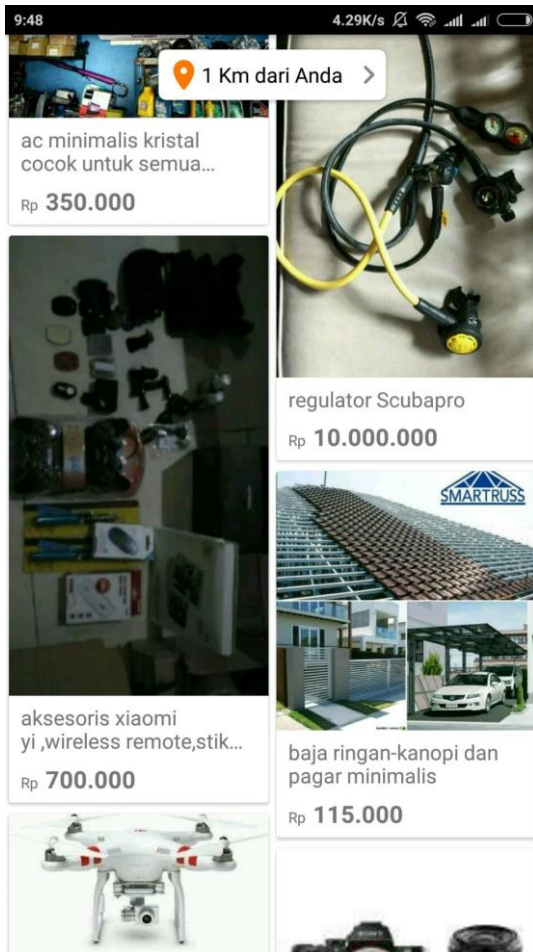


Indonesia

Image Quality Detection with Machine Learning

Hervind – Junior Data Scientist

2017-08-05



The goal is help our user

OLX Global Innovation Awards 2017



HOW?



image quality machine learning



All

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Tools

About 20,100,000 results (0.63 seconds)

[Machine learning to design full-reference image quality assessment ...](#)

www.sciencedirect.com/science/article/pii/S0923596512000033

by C Charrier - 2012 - Cited by 27 - Related articles

The proposed method namely **Machine Learning-based Image Quality Measure (MLIQM)** first classifies the quality using multi-Support Vector Machine (SVM) ...

The luminance comparison between an original image I and its degraded version J is defined as

$$l(I, J) = \frac{2\mu_I\mu_J + C_1}{\mu_I^2 + \mu_J^2 + C_1} \quad (1)$$

where μ_I and μ_J , respectively, represent the mean intensity of the images I and J , and C_1 is a constant for avoiding instability when $\mu_I^2 + \mu_J^2 \approx 0$. A common choice for the stabilizing constant is $C_1 = (K_1 L)^2$, where L is the theoretical dynamic range of the image's pixels and $K_1 = 0.01$.

The contrast distortion measure is defined to have a similar form:

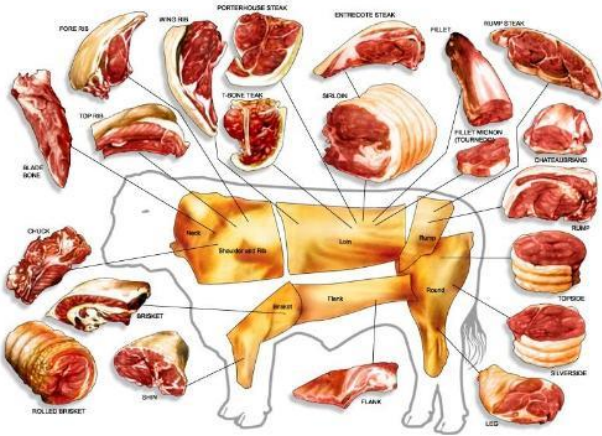
$$c(I, J) = \frac{2\sigma_I\sigma_J + C_2}{\sigma_I^2 + \sigma_J^2 + C_2} \quad (2)$$

???

Quality is subjective

The
Grey
Zone

Cooking and Machine learning



Samples
(instances, observations)

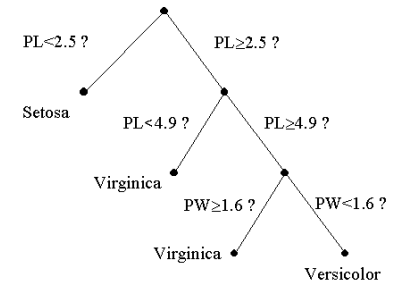
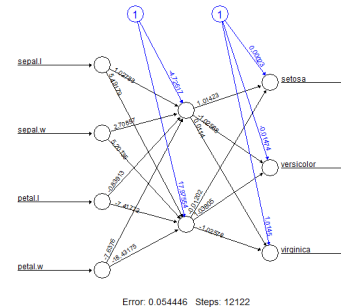
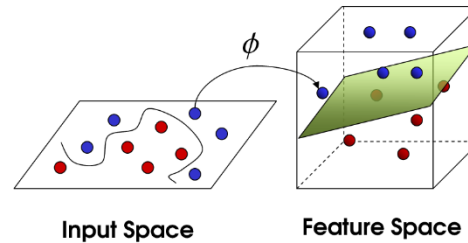
	Sepal length	Sepal width	Petal length	Petal width	Class label
1	5.1	3.5	1.4	0.2	Setosa
2	4.9	3.0	1.4	0.2	Setosa
...					
50	6.4	3.5	4.5	1.2	Versicolor
...					
150	5.9	3.0	5.0	1.8	Virginica

Features
(attributes, measurements, dimensions)

Petal

Sepal

Class labels
(targets)



What can we do with Image respect to its quality



100	98	100	105	122	135	142	145	151	157	159	2
18	9	11	18	46	33	42	68	100	133	165	1
62	55	17	61	88	71	78	101	135	165	1	1
97	85	76	77	131	142	120	137	168	205	2	2
16	13	8	14	63	61	35	58	100	138	1	1
59	61	59	59	104	94	86	89	123	166	1	1
99	88	79	83	102	127	118	99	144	159	2	2
21	13	6	16	34	56	43	24	48	148	1	1
40	56	51	57	71	86	74	57	76	163	1	1
122	97	94	87	110	156	129	99	111	191	2	2
46	15	14	16	43	87	57	27	45	142	1	1
82	51	14	44	74	116	91	65	81	164	2	2
100	127	146	115	139	162	119	98	127	202	2	2
60	43	42	41	66	88	44	27	65	160	1	1
95	76	75	68	95	121	83	71	106	184	2	2
152	138	132	130	133	129	110	105	159	218	2	2
68	56	55	62	54	42	32	38	107	185	2	2
102	85	82	90	86	80	74	82	143	204	2	2
135	141	148	137	127	107	116	145	200	226	2	2
49	60	63	60	47	26	40	89	160	198	1	1
86	92	95	92	86	69	86	128	187	210	2	2
111	108	115	100	112	137	186	220	229	2	2	2
26	24	30	24	39	53	79	143	189	199	1	1
65	60	69	63	82	98	120	175	207	207	1	1
134	122	129	121	128	162	186	208	220	222	2	2
54	34	34	44	60	107	144	179	194	190	1	1
93	76	78	90	107	149	180	201	207	195	1	1
162	150	144	153	169	192	206	220	219	224	2	2
76	71	73	91	107	148	170	189	187	187	1	1
123	126	129	142	156	171	182	195	192	194	1	1
187	182	184	186	196	214	226	231	230	234	2	2



Blurriness

Distinct Pixel Rate



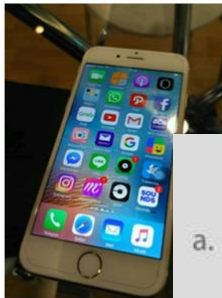
1.85%



16.30%



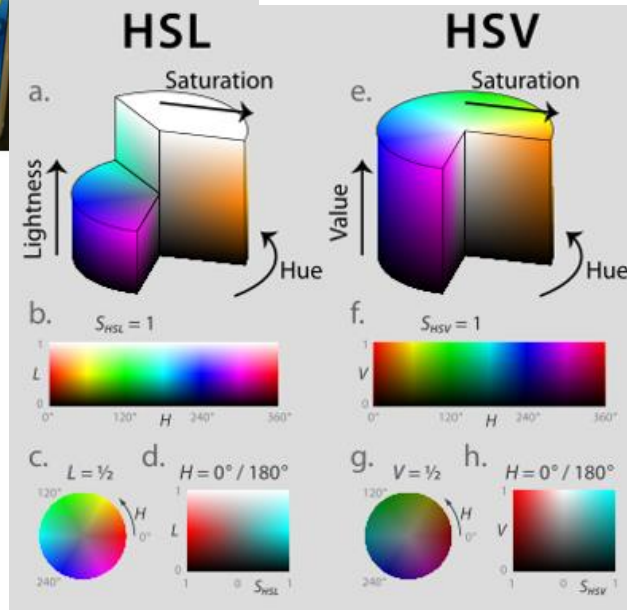
3.15%



33.07%



Saturation



Sharpness

Original image

Sharpened

Over-sharpened



colorfulness

$$\sigma_{rgyb} = \sqrt{\sigma_{rg}^2 + \sigma_{yb}^2}$$

$$\mu_{rgyb} = \sqrt{\mu_{rg}^2 + \mu_{yb}^2}$$

$$C = \sigma_{rgyb} + 0.3 * \mu_{rgyb}$$

Don't worry, python script for this is on my GitHub

Least Colorful

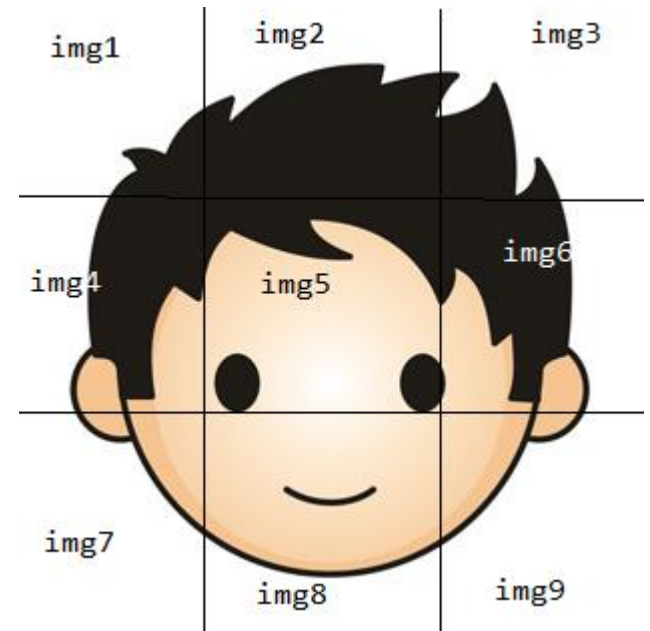


Most Colorful



It Is Not Fair to Judge from Whole Image

consider this picture

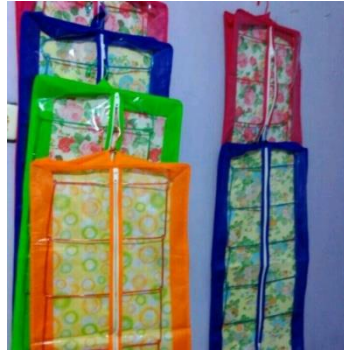


The Result

Model:
Gradient Boosting Classifier



False Positive



False Negative



The most exciting phrase to hear in science, the one that heralds new discoveries, is not "Eureka!" (I found it!) but "That's funny ..."

— Isaac Asimov

SIMULATION ?



Reference

- C. Charrier, O. Lezoray, G. Leburn, Machine learning to design full-reference image quality assessment algorithm: Signal Processing: Image Communication, 2012, pp. 209-219.
- A. Bouzerdoun, A. Havstad, A. Beghdadi, Image quality assessment using a neural network approach, in: Fourth IEEE International Symposium on Signal Processing and Information Technology, 2004, pp. 330–333.
- <http://www.pyimagesearch.com/2015/09/07/blur-detection-with-opencv/>
- <http://www.pyimagesearch.com/2017/06/05/computing-image-colorfulness-with-opencv-and-python/>
- <https://medium.com/@hervindphilipe/can-machine-predict-the-quality-of-image-5e8d63163308>

Python script for image quality metrics:

https://github.com/hervindphil/image_quality/



*Thank
you*



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