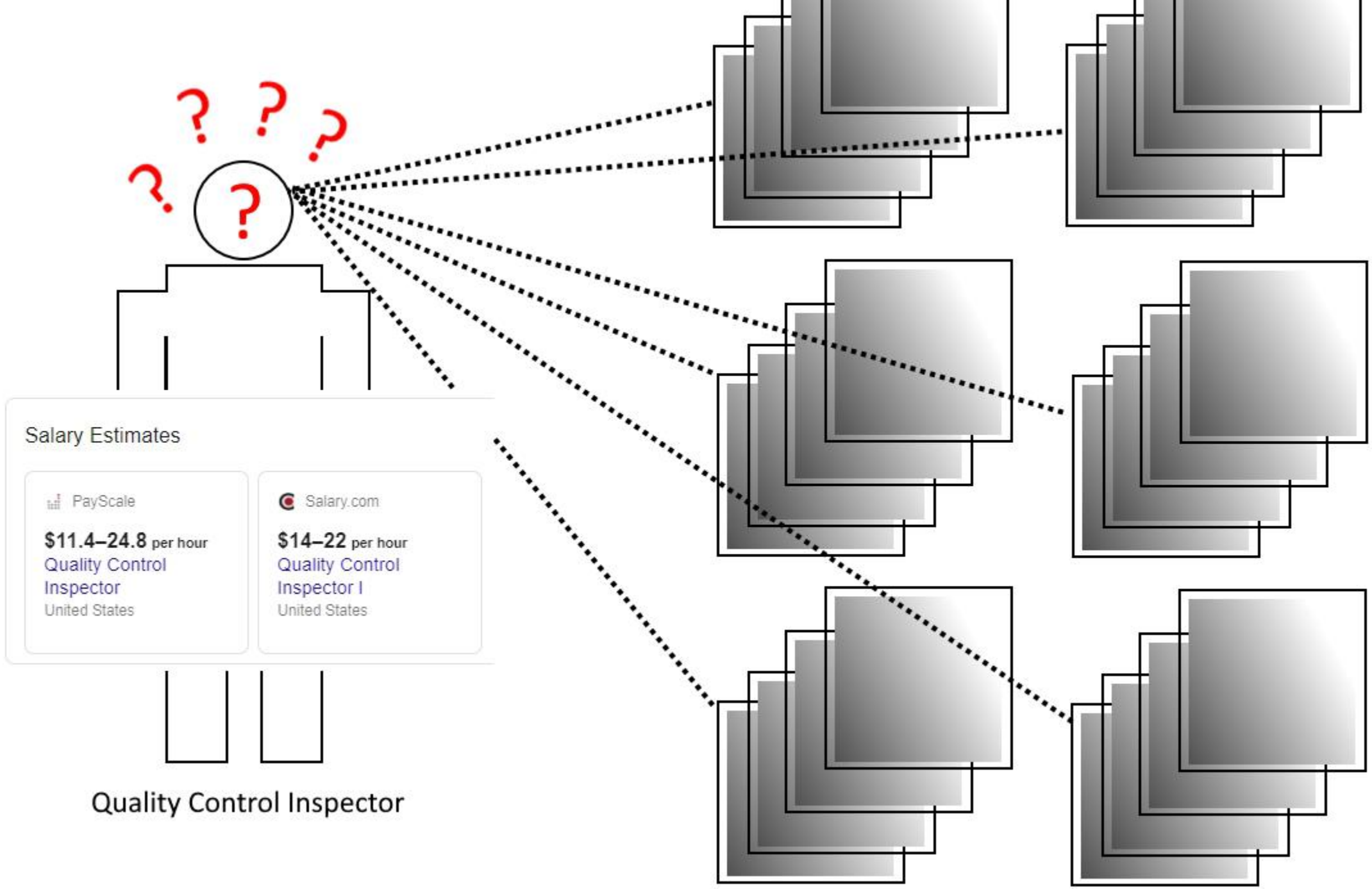
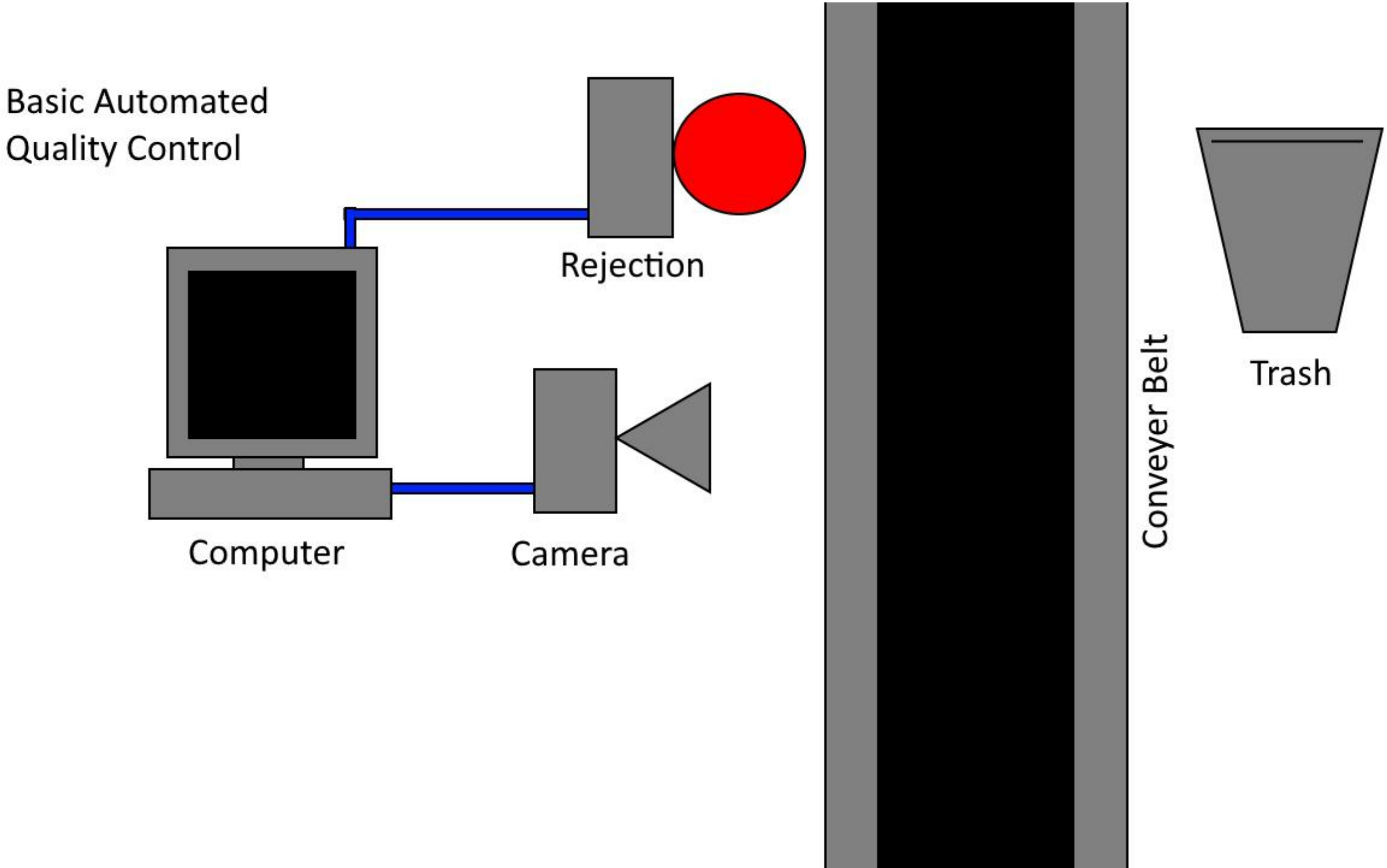

Salary Estimates
PayScale
$11.4–24.8 per hour
Quality Control Inspector
United States
Salary.com
$14–22 per hour
Quality Control Inspector I
United States
Quality Control Inspector


Basic Automated
Quality Control
Rejection
Computer
Camera
Conveyer Belt
Trash

Business Insider Nordic

Walmart, Trader Joe's, Costco, and Kroger egg products recalled after being linked to deadly…

3 days ago

WRAL.com

Recall: Hard boiled eggs recall expanded to include Walmart, Costco, Lidl and mor…

1 day ago

UPI UPI.com

Hard-boiled eggs recall expanded in deadly listeria outbreak

3 days ago

Tampa Bay Times

Newly released details on medical device failures spark lawsuits

The Pharm3r report also found that the devices in the hidden data were more likely to be subject to a Class 1 recall, initiated when a device …

4 weeks ago

KDHE warns of meat recall in Clay Center

Jalopnik

Just Like The Recalls, Takata Airbag Lawsuits Are Still Coming

After many years, lawsuits, recalls, injuries, deaths, and reports of malpractice by both manufacturers and automakers, the Takata airbag saga …

2 days ago

Why do we need Quality Control?

Cece's Noodles issues recall over listeria fears

By STORM GIFFORD
NEW YORK DAILY NEWS | DEC 28, 2019 | 8:40 PM

Most recalled cars

2018 Chrysler Pacifica

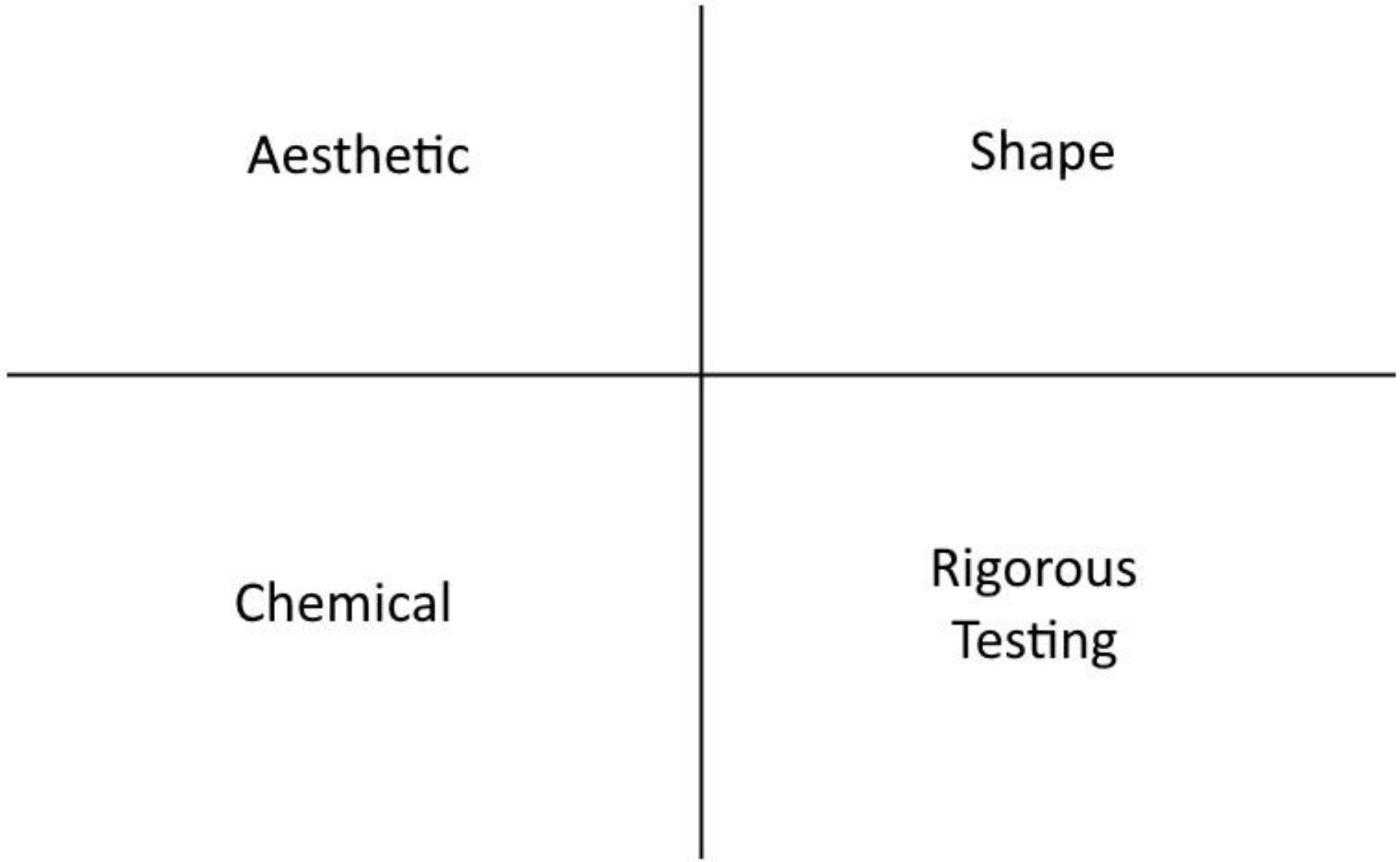
2018 Audi A6

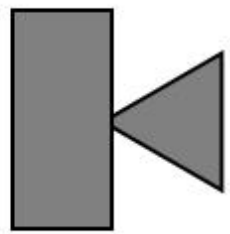
2018 Mercedes… GLA-Class

2019 BMW X3

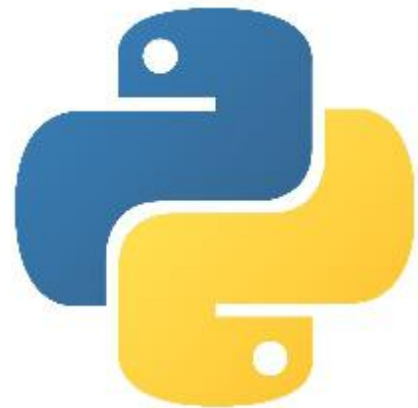
2018 Dodge Journey

What kinds of Quality Control Inspection is there?

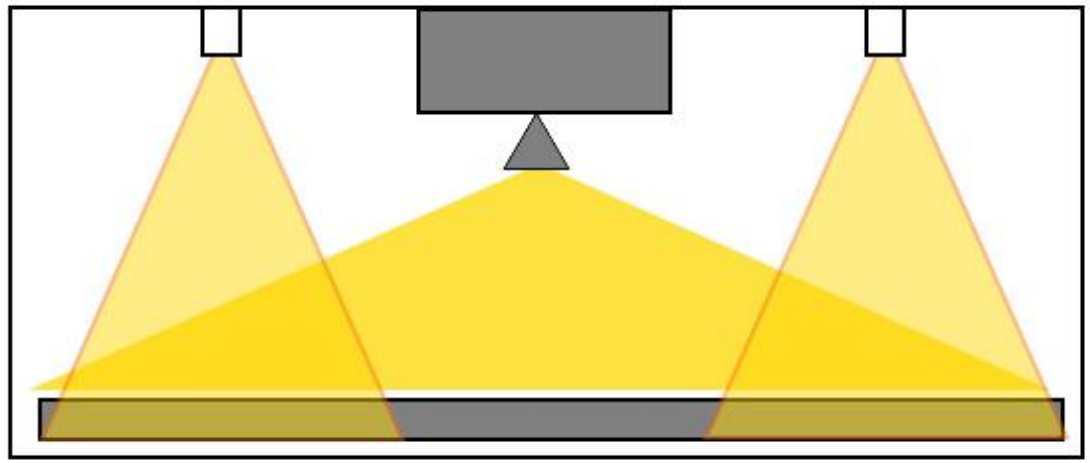




Camera

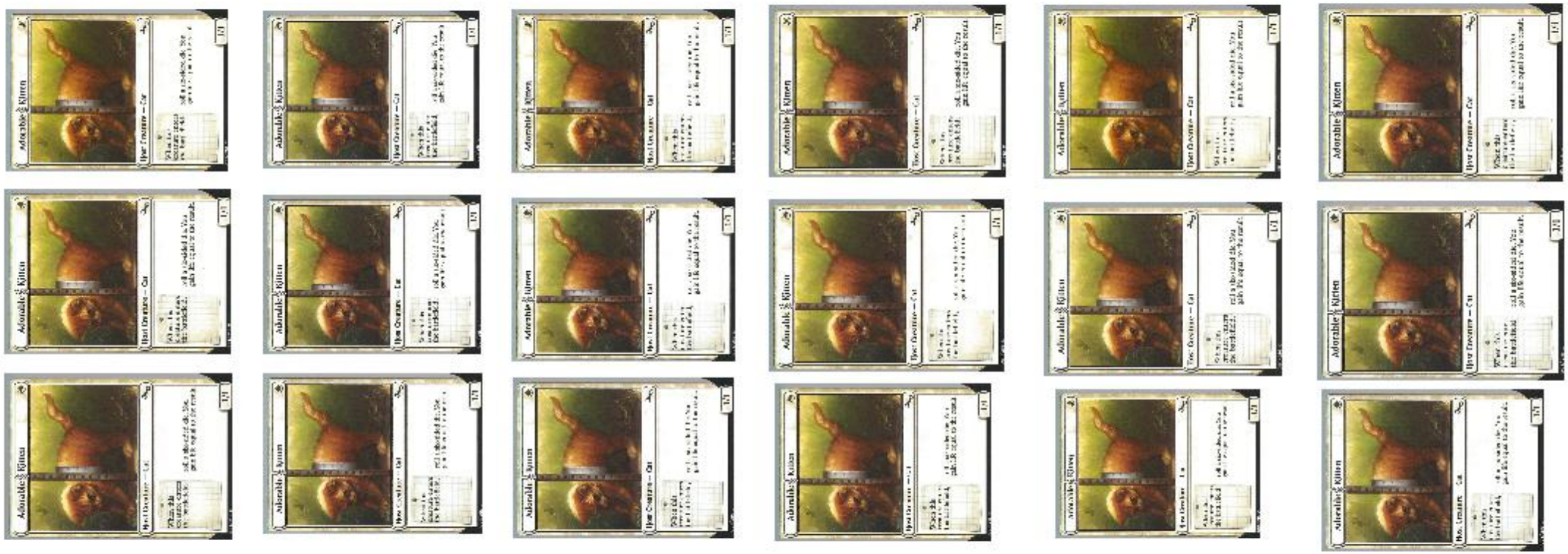


Python



Self made Rig

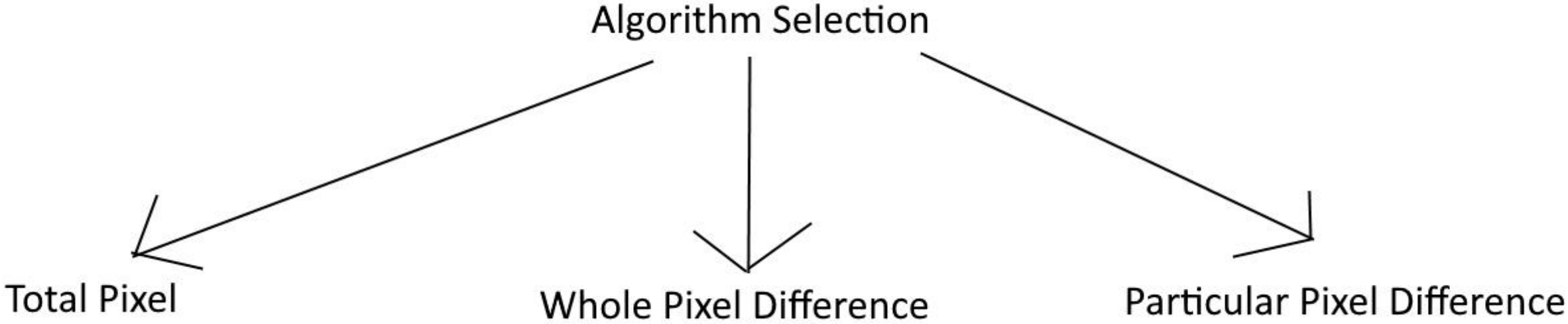
Challenge Concept



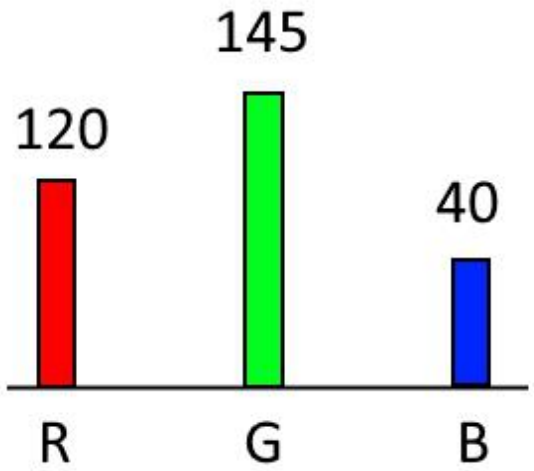
defects

errors

Sample to compare


Algorithm Selection
Total Pixel
Whole Pixel Difference
Particular Pixel Difference

Total Pixel Difference

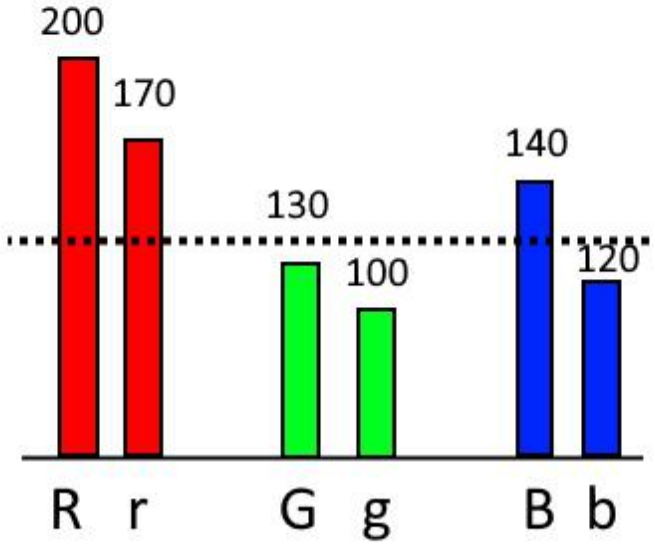


total_pixel_picture_1[120][145][40] += 1

$$\frac{\text{absolute\_value((total\_pixel\_picture\_1) - (total\_pixel\_picture\_2))}}{\text{(Picture Height X Picture Width)}} \text{ X 100 =}$$

Percentage Pixel difference by composition

Particular Pixel Difference



Two cases:

1: Lowest value is below 127.5 , max difference reference is 255

2: Lowest value is above 127.5 , max difference reference is 0

3: Pixel values are integers and can't be at 127.5

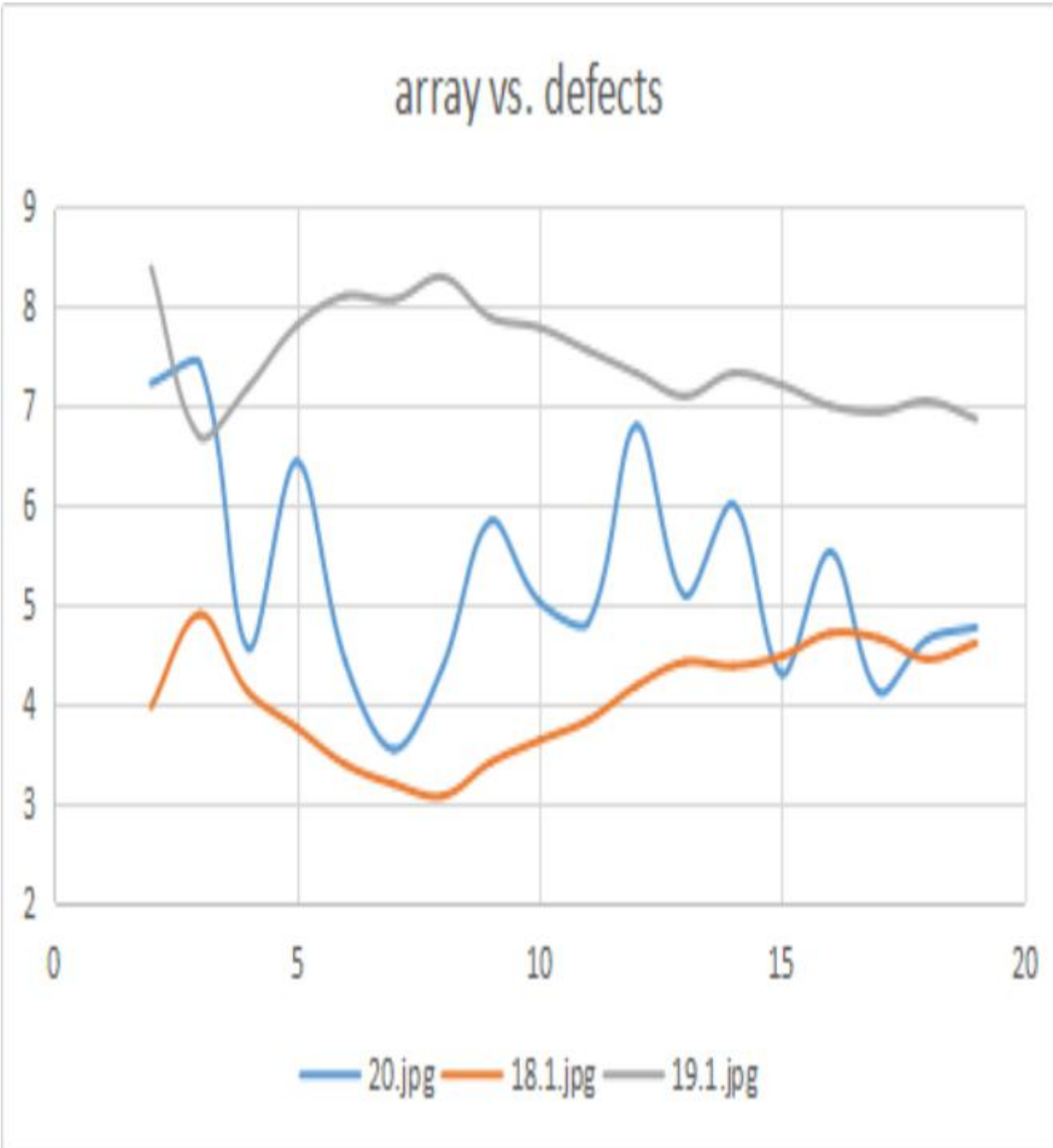
*% difference is not calculated the normal way, it takes limits into account. i.e. G = 130, g = 100, would be 30% normally but it doesn't take limits into account and allows for higher than 100% difference. This method constrains it to 100% as its maximum difference.

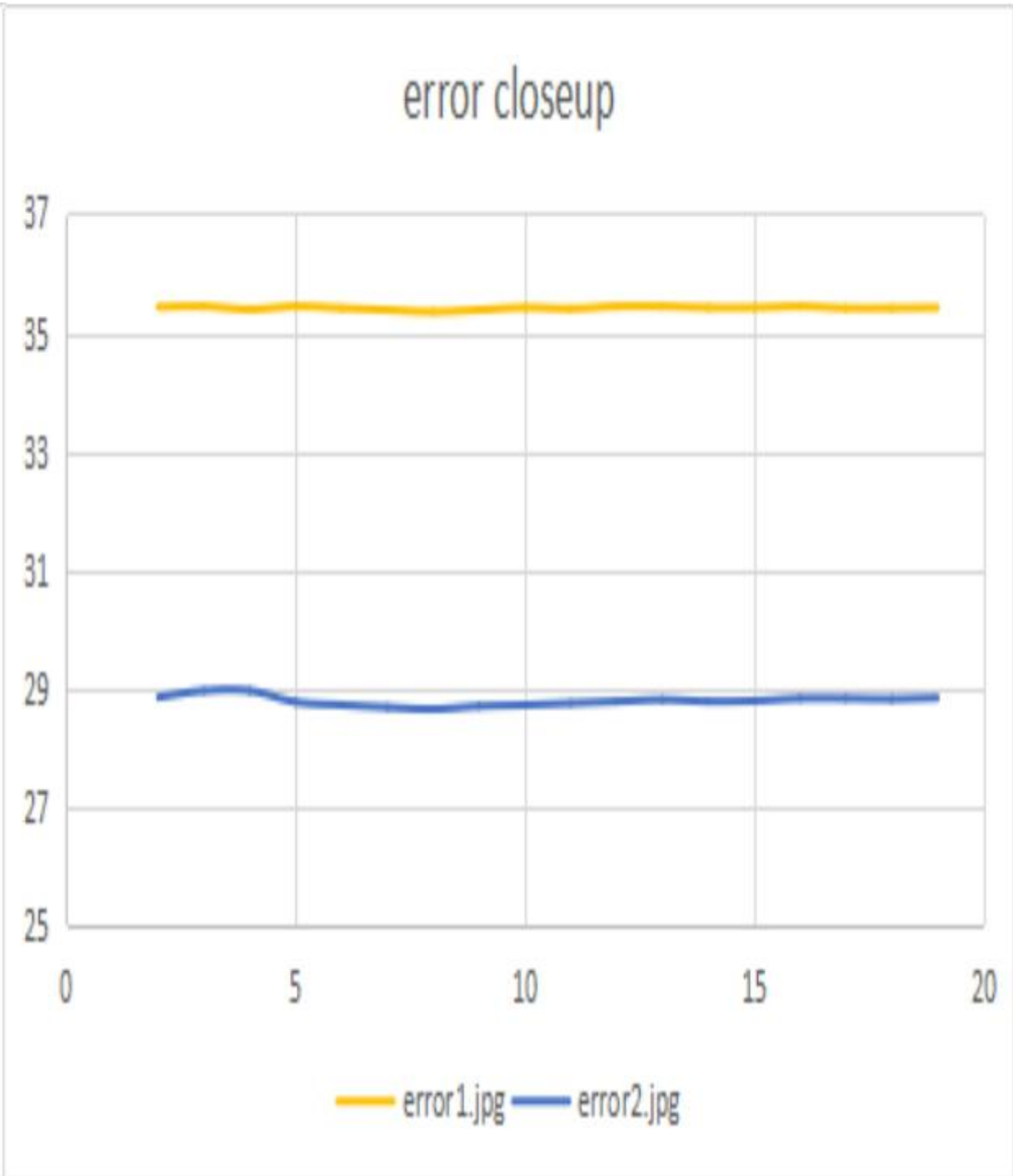
(17.65 + 19.35 + 14.81)/3 = 17.21%

RGB = picture 1 pixel at location (X, Y)

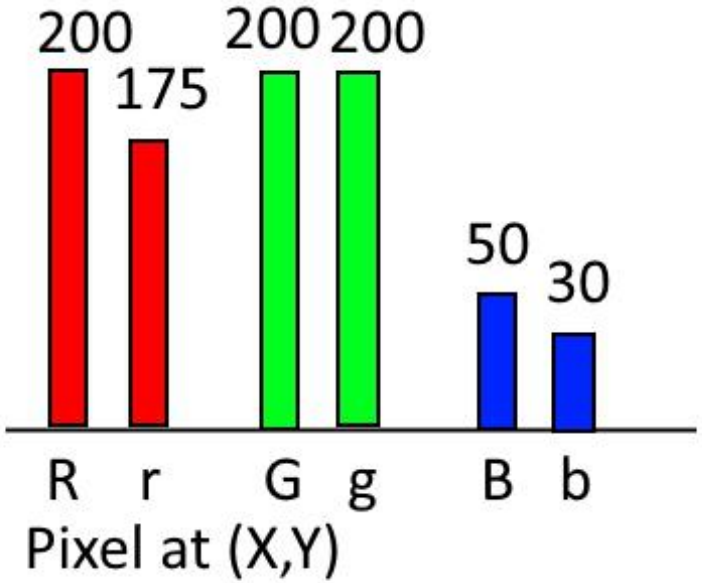
rgb = picture 2 pixel at same location (X, Y)

R = 200, r = 170 Case 2 Δ = 200 - 170 = 30 Ref = 170 - 0 = 170 Dif(%) = (30/170) X 100 = 17.65%	G = 130, g = 100 Case 1 Δ = 130 - 100 = 30 Ref = 255 -100 = 155 Dif(%) = (30/155) X 100 = 19.35%	B = 140, b = 120 Case 1 Δ = 140 - 120 = 20 Ref = 255 - 120 = 135 Dif(%) = (20/135) X 100 = 14.81%

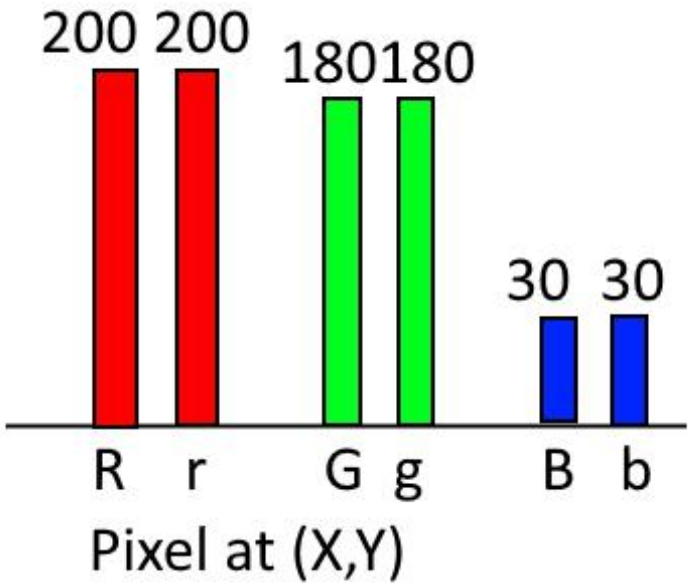

array vs. defects
9
8
7
6
5
4
3
2
0
5
10
15
20
20.jpg
18.1.jpg
19.1.jpg


error closeup
37
35
33
31
29
27
25
0
5
10
15
20
error1.jpg
error2.jpg

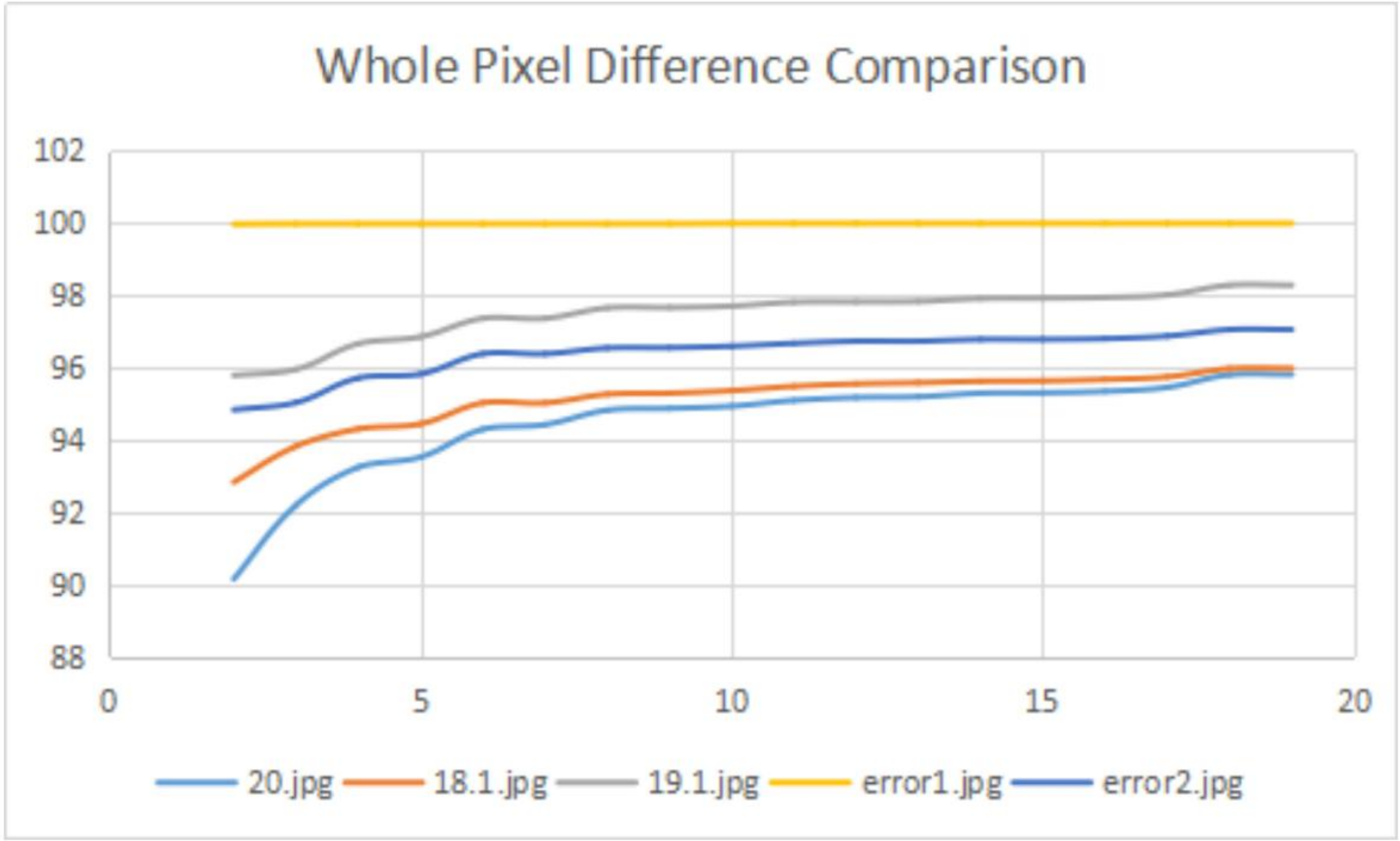
Whole Pixel Algorithm:

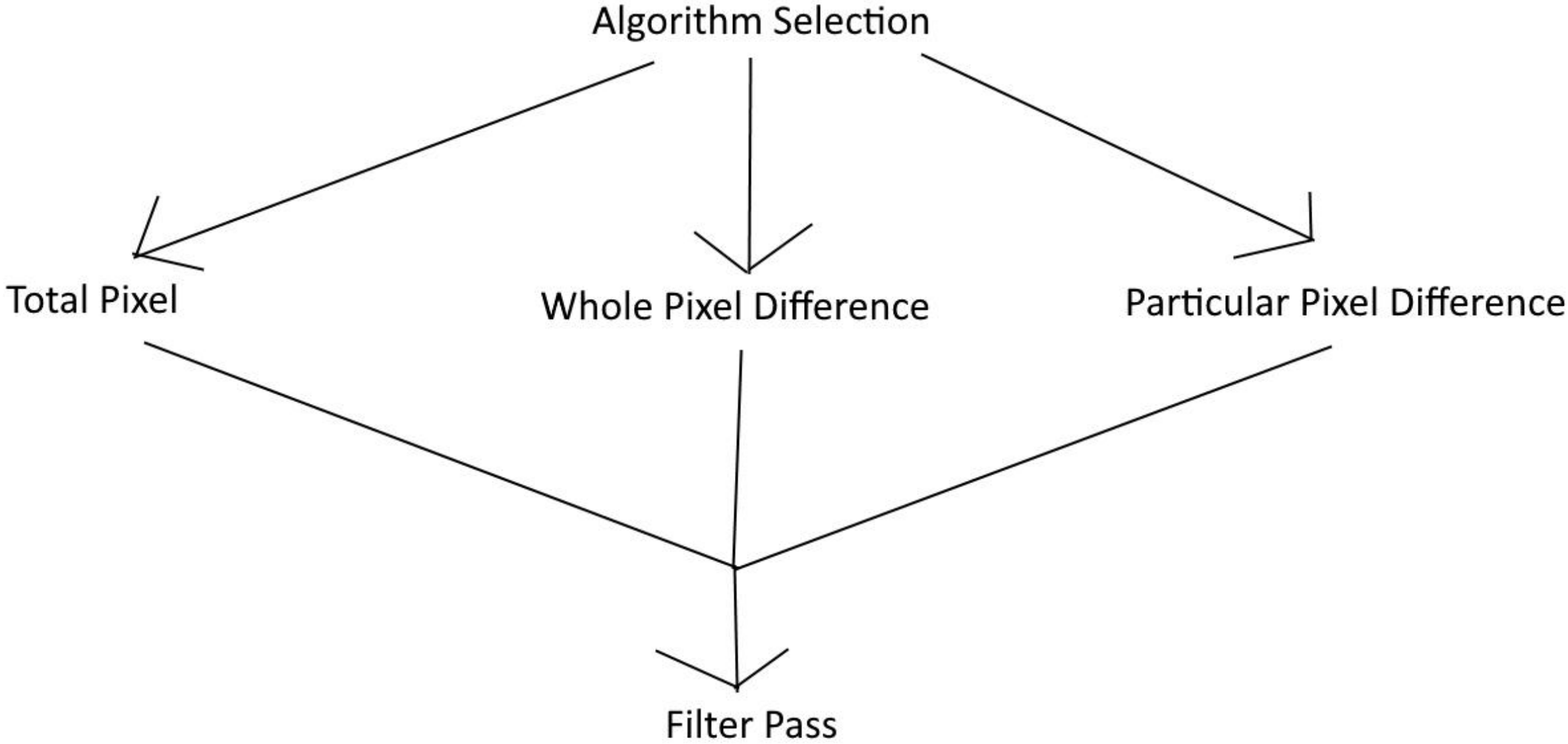


Case 1: pixels are considered different if they are not exactly the same, it is considered a different pixel.

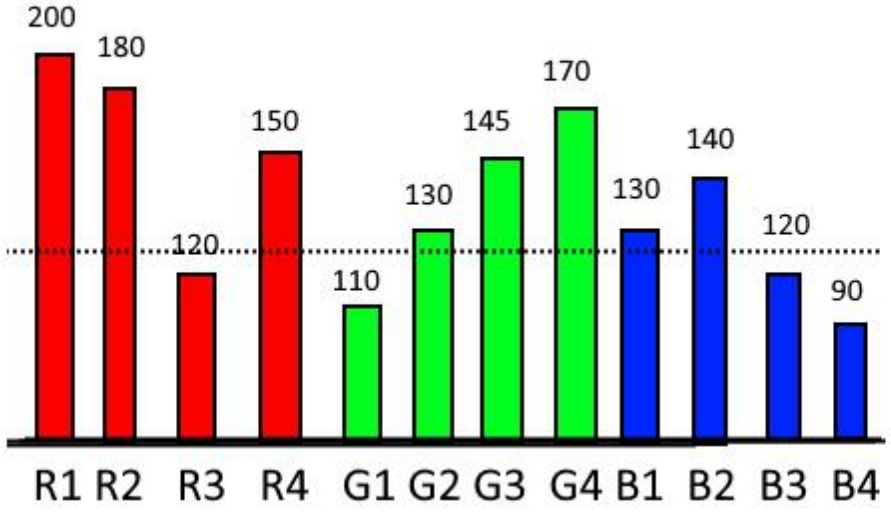


Case 2: pixels are considered similar if they are exactly the same.


Whole Pixel Difference Comparison
102
100
98
96
94
92
90
88
0
5
10
15
20
20.jpg
18.1.jpg
19.1.jpg
error1.jpg
error2.jpg


Algorithm Selection
Total Pixel
Whole Pixel Difference
Particular Pixel Difference
Filter Pass

Filter Pass Algorithm:

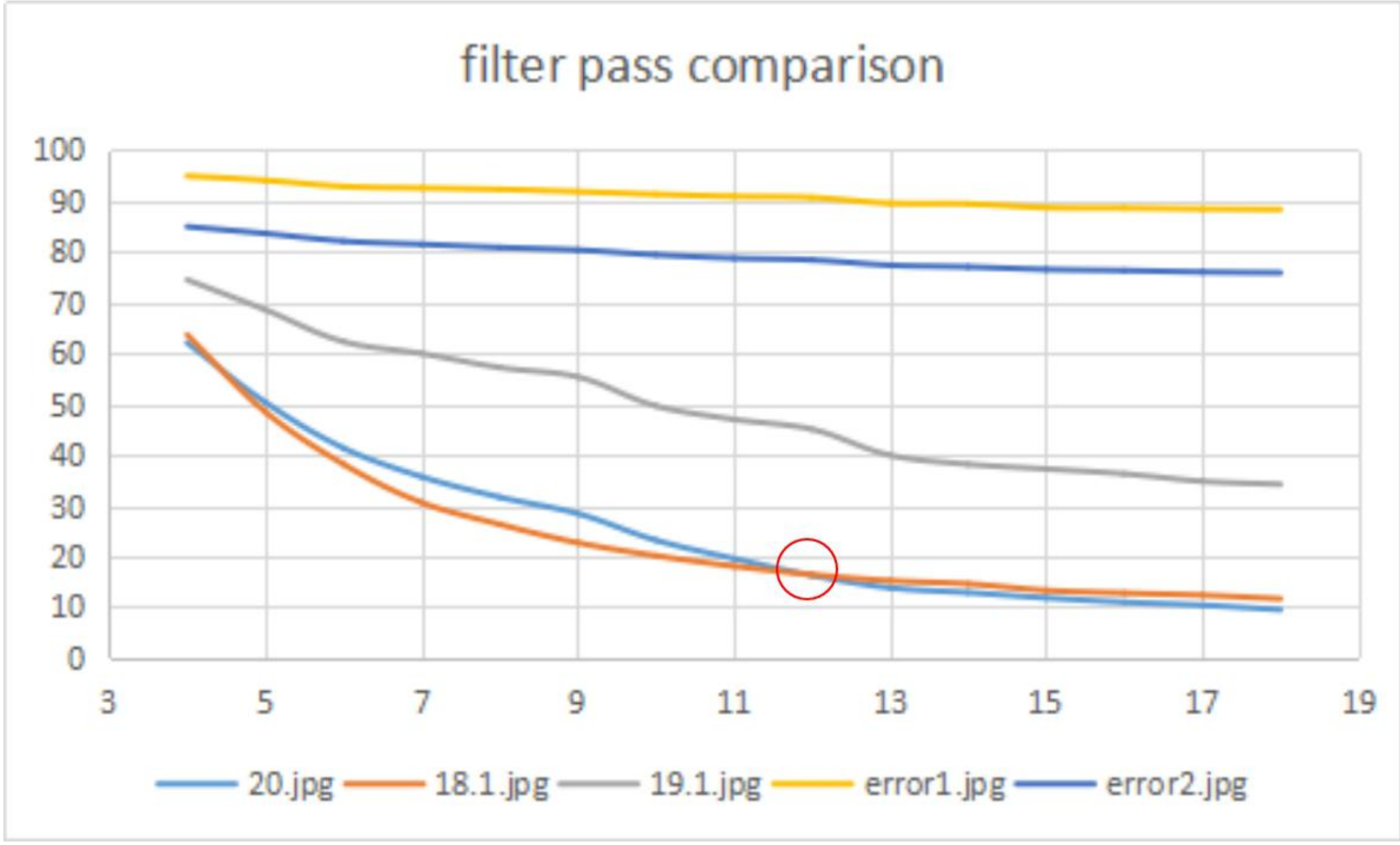


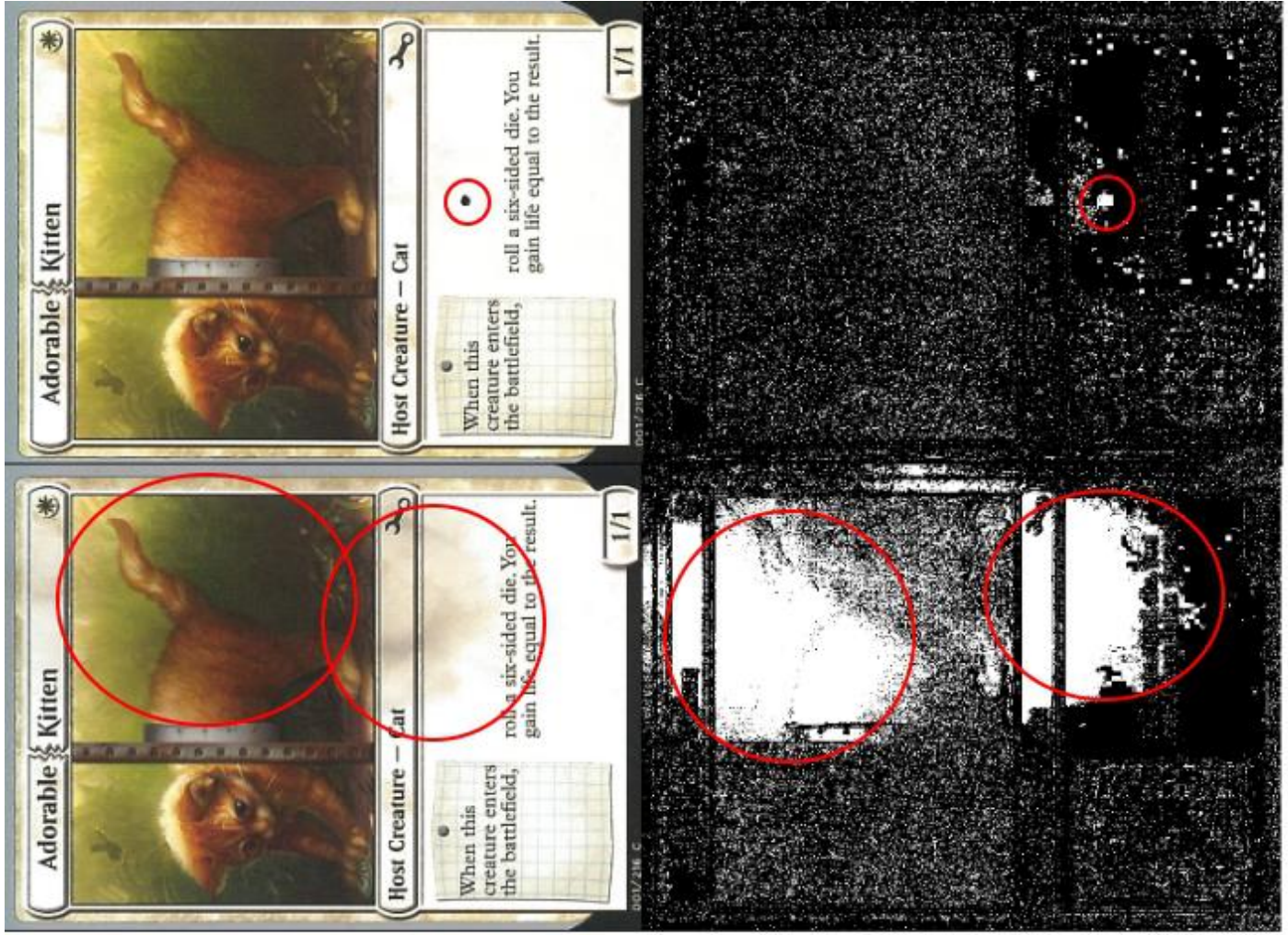
Sample 1 pixel at X, Y: (R1, G1, B1)
S2: (R2, G2, B2), S3: (R3, G3, B3),
S4: (R4, G4, B4).

Creation of filter limits, between S1 and S2:

(R1, G1, B1):(200,110,130),(R2,G2,B2):(180,130,140)
Max Limit:(200,130,140), Min Limit:(180,110,130)
Adjusting for S3:
(R3,G3,B3): (120,145,120)
Adj max limit:(200,145,140), Adj min limit:(120,110,120)
Adjusting for S4:
(R4,G4,B4): (150,170,90)
Adj max limit:(200,170,140), Adj min limit:(120,110,90)

If S5 is below max:(200,170,140) and above min:(120,110,90) then its acceptable.
Otherwise it is considered rejected.


filter pass comparison
100
90
80
70
60
50
40
30
20
10
0
3
5
7
9
11
13
15
17
19
20.jpg
18.1.jpg
19.1.jpg
error1.jpg
error2.jpg



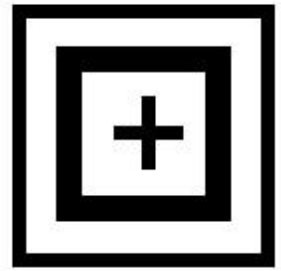
18.1
(small dot)

19.1
(burn)

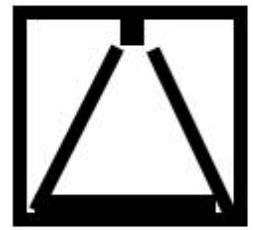
20 (control)

Max difference of 18.1 dot:
14 X 17 -> 7 X 8.5 X π - > 186.9 px
(186.9 / 704,358) X 100 -> 00.02%

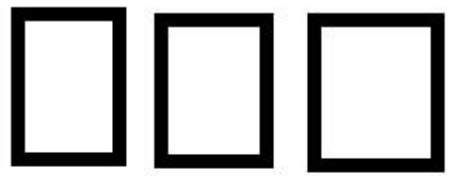
Precise positioning



Consistent Lighting



Verified Samples



Defect Samples

Continually Improving Algorithm