

Optical Mark Recognition

May 11, 2021

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Problem challenges:

Unfortunately, the challenges of an image processing task are usually higher, more difficult than a traditional software program because unlike the traditional programs, the computer is actually trying to understand something!

We can present some of these challenges in the following bullet points.

- **Resolution problem:** *there are too many things that can affect the resolution of an image. Lighting or different camera mobile or the angle where you took the image are all a disadvantage in those systems because they can dramatically destroy the accuracy. And the reason for this is that the values of pixels change every time.*
- **Too many hyperparameters to tune (we will discuss this in a greater detail later):** *every time you do for example an edge detection task, you need to give the function some parameters with your choice, if those values are slightly not accurate, they can miss up the whole thing!*

- **Overfitting the model you are working on:** *for any machine learning or deep learning engineer or even a data scientist, it's very obvious that the main problem of all time is the ability of your model to generalize, can a system that has the ability to recognize cars also recognize trucks? Can the model that corrects the answers for 100 problem corrects more, like say 150 or 200 or further. The answer is usually no because that is not the way that machines think yet, and to be honest **that's a really hard problem**. But the research is also going too fast toward this direction, researches are trying to invent stronger types of neural networks to be able to mimic precisely how human can generalize.*
- **Too many questions:** *that means even smaller shapes to deal with which makes the problem even harder*

model sheets offered:

	a	b	c	d		a	b	c	d		a	b	c	d		a	b	c	d
1	●	○	○	○	39	●	○	○	○	77	○	○	○	○	115	●	○	○	○
2	○	○	○	○	40	○	○	○	○	78	○	○	○	○	116	○	○	○	○
3	○	○	○	○	41	○	○	○	○	79	○	○	○	○	117	○	○	○	○
4	○	○	○	○	42	○	○	○	○	80	○	○	○	○	118	○	○	○	○
5	○	○	○	○	43	○	○	○	○	81	○	○	○	○	119	○	○	○	○
6	○	○	○	○	44	○	○	○	○	82	○	○	○	○	120	○	○	○	○
7	○	○	○	○	45	○	○	○	○	83	○	○	○	○	121	○	○	○	○
8	○	○	○	○	46	○	○	○	○	84	○	○	○	○	122	○	○	○	○
9	○	○	○	○	47	○	○	○	○	85	○	○	○	○	123	○	○	○	○
10	○	○	○	○	48	○	○	○	○	86	○	○	○	○	124	○	○	○	○
11	○	○	○	○	49	○	○	○	○	87	○	○	○	○	125	○	○	○	○
12	○	○	○	○	50	○	○	○	○	88	○	○	○	○	126	○	○	○	○
13	○	○	○	○	51	○	○	○	○	89	○	○	○	○	127	○	○	○	○
14	○	○	○	○	52	○	○	○	○	90	○	○	○	○	128	○	○	○	○
15	○	○	○	○	53	○	○	○	○	91	○	○	○	○	129	○	○	○	○
16	○	○	○	○	54	○	○	○	○	92	○	○	○	○	130	○	○	○	○
17	○	○	○	○	55	○	○	○	○	93	○	○	○	○	131	○	○	○	○
18	○	○	○	○	56	○	○	○	○	94	○	○	○	○	132	○	○	○	○
19	○	○	○	○	57	○	○	○	○	95	○	○	○	○	133	○	○	○	○
20	○	○	○	○	58	○	○	○	○	96	○	○	○	○	134	○	○	○	○
21	○	○	○	○	59	○	○	○	○	97	○	○	○	○	135	○	○	○	○
22	○	○	○	○	60	○	○	○	○	98	○	○	○	○	136	○	○	○	○
23	○	○	○	○	61	○	○	○	○	99	○	○	○	○	137	○	○	○	○
24	○	○	○	○	62	○	○	○	○	100	○	○	○	○	138	○	○	○	○
25	○	○	○	○	63	○	○	○	○	101	○	○	○	○	139	○	○	○	○
26	○	○	○	○	64	○	○	○	○	102	○	○	○	○	140	○	○	○	○
27	○	○	○	○	65	○	○	○	○	103	○	○	○	○	141	○	○	○	○
28	○	○	○	○	66	○	○	○	○	104	○	○	○	○	142	○	○	○	○
29	○	○	○	○	67	○	○	○	○	105	○	○	○	○	143	○	○	○	○
30	○	○	○	○	68	○	○	○	○	106	○	○	○	○	144	○	○	○	○
31	○	○	○	○	69	○	○	○	○	107	○	○	○	○	145	○	○	○	○
32	○	○	○	○	70	○	○	○	○	108	○	○	○	○	146	○	○	○	○
33	○	○	○	○	71	○	○	○	○	109	○	○	○	○	147	○	○	○	○
34	○	○	○	○	72	○	○	○	○	110	○	○	○	○	148	○	○	○	○
35	○	○	○	○	73	○	○	○	○	111	○	○	○	○	149	○	○	○	○
36	○	○	○	○	74	○	○	○	○	112	○	○	○	○	150	○	○	○	○
37	○	○	○	○	75	○	○	○	○	113	○	○	○	○	151	○	○	○	○
38	○	○	○	○	76	○	○	○	○	114	○	○	○	○	152	○	○	○	○

Fig1 152 question sheet

ROLL NO. <div style="border: 1px solid black; width: 100px; height: 15px; margin: 2px;"></div>	INSTRUCTIONS FOR FILLING THE SHEET 1. This sheet should not be folded or creased. 2. Use only blue/black ball point pen to fill the circles. 3. Use of pencils is strictly prohibited. 4. Circles should be darkened completely and properly. 5. Cutting and erasing on this sheet is not allowed. 6. Do not use any stray marks on this sheet. 7. Do not use marker or enable that is not the mark. <div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> WRONG METHODS </div> <div> CORRECT METHOD </div> </div> <div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div> Candidate Sign <div style="border: 1px solid black; width: 100px; height: 30px; margin: 2px;"></div> </div> <div> Invigilator Sign <div style="border: 1px solid black; width: 100px; height: 30px; margin: 2px;"></div> </div> </div>	<div style="text-align: center; font-weight: bold; font-size: 1.2em;">Your Institute Name & Logo</div> <div style="text-align: center; border: 1px solid black; width: 100px; margin: 5px auto; font-weight: bold; font-size: 0.8em;">OMR ANSWER SHEET</div> <div style="margin-top: 10px;"> Name _____ Batch _____ Mobile No. _____ Test Date ____/____/____ </div>
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1 A B C D	51 A B C D	101 A B C D	151 A B C D
1	51	101	151
2	52	102	152
3	53	103	153
4	54	104	154
5	55	105	155
6	56	106	156
7	57	107	157
8	58	108	158
9	59	109	159
10	60	110	160
11	61	111	161
12	62	112	162
13	63	113	163
14	64	114	164
15	65	115	165
16	66	116	166
17	67	117	167
18	68	118	168
19	69	119	169
20	70	120	170
21	71	121	171
22	72	122	172
23	73	123	173
24	74	124	174
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26	76	126	176
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41	91	141	191
42	92	142	192
43	93	143	193
44	94	144	194
45	95	145	195
46	96	146	196
47	97	147	197
48	98	148	198
49	99	149	199
50	100	150	200

Fig 2 200 question sheet

Later we will discuss the difference between two models and why the 150 questions model is less prone to low accuracy, or why it's more reliable and holding many advantages.