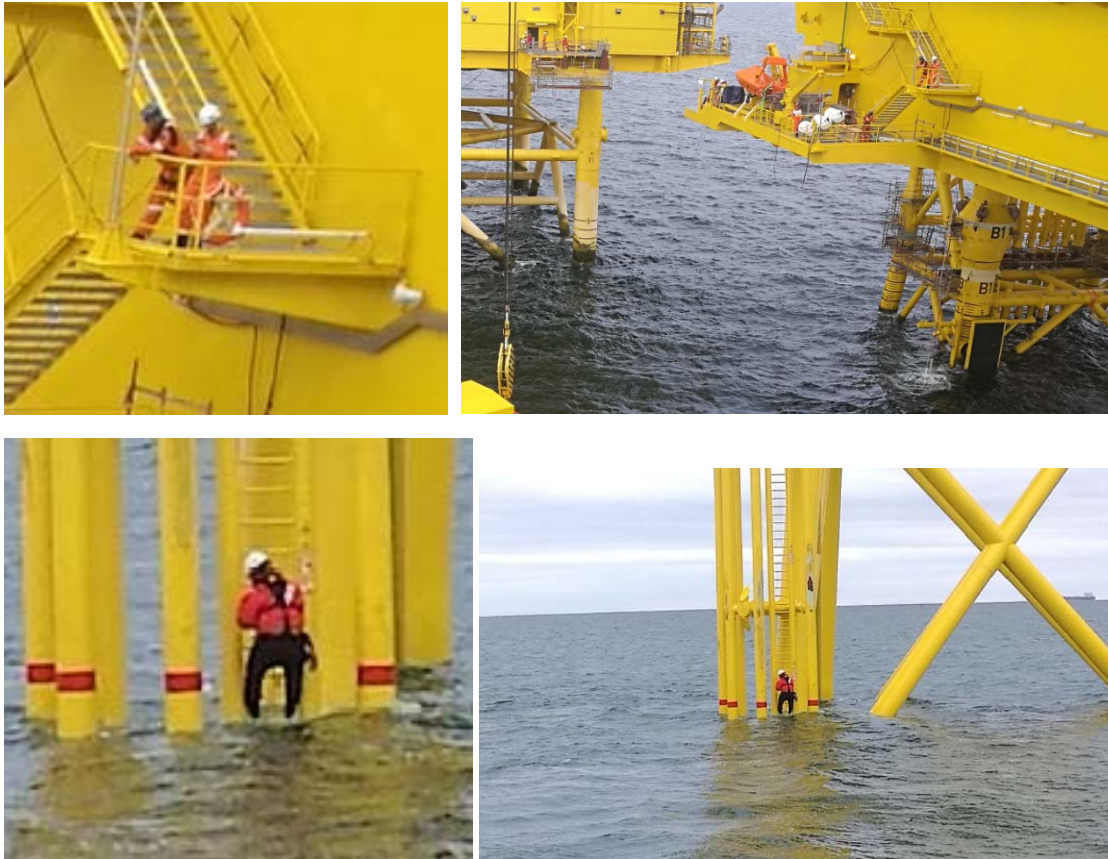


### Issue 1. Analyzing only the target area

Problem is that we neglect the main colors in the whole image which play an important role in the search time. For example: Blue contrast well with yellow (RGB space) in below targets (left images). However, in the overall blue tones of sea and sky affect the ability of a viewer to spot people wearing blue clothes.

**Solution:** Analyze the whole image. Also, more user friendly as it requires less input from the user.



**Issue 2: Use of RGB color. Space does not fit the visual perception of humans.** There is shift in the optimal color depending on the colors space (we tested sensitivity, RGB, weight RGB, HSV, CIE Lab).

$$\sqrt{2 \times \Delta R^2 + 4 \times \Delta G^2 + 3 \times \Delta B^2},$$

one of the better low-cost approximations (using a color range of 0–255),<sup>[1]</sup>

$$\bar{r} = \frac{C_{1,R} + C_{2,R}}{2}$$

$$\Delta R = C_{1,R} - C_{2,R}$$

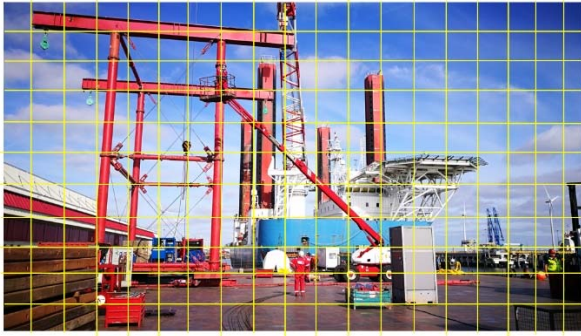
$$\Delta G = C_{1,G} - C_{2,G}$$

$$\Delta B = C_{1,B} - C_{2,B}$$

$$\Delta C = \sqrt{\left(2 + \frac{\bar{r}}{256}\right) \times \Delta R^2 + 4 \times \Delta G^2 + \left(2 + \frac{255 - \bar{r}}{256}\right) \times \Delta B^2}$$



### Issue 3: Weight factors is ranking safety vest.

Initially we penalize the worse performing colors (threshold 80) by changing their distance to zero. However, when assessing the whole picture, the optimal color in was not what we expected. For example, in the picture below there many windows with blue color, which help the red safety color rank well.



We tested (1) Further penalizing (-100) or step penalization had a positive effecting for the optimal safety color of the total image to stand out. We also considered correlation to the neighboring widows before penalizing. Example: Red – Blue below.



	92.0 Blue	100.0 Green	54.0 Red	96.0 Yellow	68.0 Orange	87.0 Magenta
	68.0 Blue	92.0 Green	100.0 Red	97.0 Yellow	88.0 Orange	75.0 Magenta

**Finally, a much easier solution.** We only pinalise. Not positive values. The less pinalised safety color is the list common color in the image and thus construsting well to most part of the picture.