

Website Report

Summary:

This document will show the first update of the website made for the current work, and some explaining about style related decisions. It also includes information about the algorithm development, since we are getting achievements.

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AUTHOR(S)	<i>Rosado Junquera, Pablo J.</i>	Documentation	04/10/2019
	<i>Cadix Martín, Victor</i>	Technology leader	04/10/2019
APPROVAL	<i>De la Quintana Béjar, Hugo</i>	Executive officer	08/10/2019
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Team

DEPARTMENT / ROLE	NAME
Technology leader	<i>Cadix Martín, Víctor</i>
Programming chief	<i>Casa Rodríguez, Alejandro</i>
Executive Officer	<i>De la Quintana Béjar, Hugo</i>
Validation leader	---
Documentation	<i>Rosado Junquera, Pablo J.</i>

Revision record

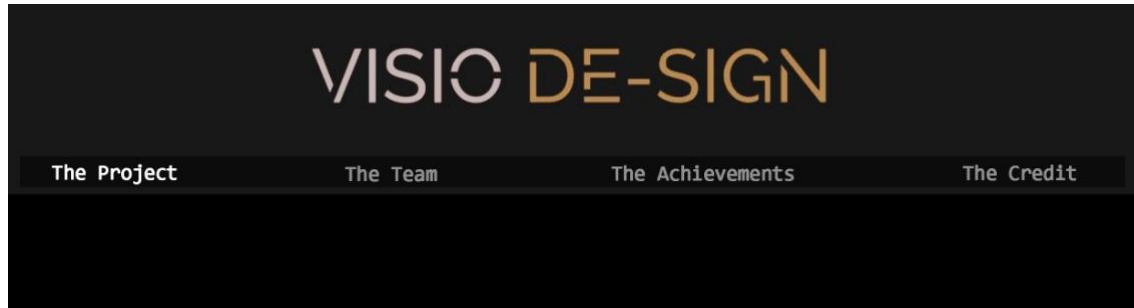
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1. The website

To design the website, we have followed an idea of simplicity and elegance. Thus, our first sketch includes just 4 or 5 buttons, with a centred dashboard that allow the user to navigate through different tabs. The selected logo is a modification of the main one, with a darker style, not to distract the viewer from the rest of the window.



The first button "**The Project**" would lead the user to a page with information about the work main target, as well as the strategies we are adopting. It would also include some algorithm explanation, and our ideal final concept. On the other hand, "**The Team**" introduces us, with a short story for each team member: who we are, our interests, career path and a bit of personal information to get close to the user.

The third option "**The Achievements**" is an update board, where every change or new would be posted. The idea is keeping in touch with the user, and having a history of the whole development, timing and achievements got. Finally, "**The Credit**" includes a citation for every single information source that allow us to accomplish our objective.

Another point to deal with is the host, an issue we have already solved. The website can be accessed through the URL: <http://visiode-sign.sytes.net:41080/>.

2. The software updates

In order to obtain the regions of interest in an image, we have started by down sapling the image to a 20x26 resolution (Figure 1). This choice comes from the idea of take the minimum information needed to be able to extract the relevant zones (where a signal can be) and remove the non-uniform colour areas (like the road).



Figure 1. Original image (left). Low resolution (right)

The next step has been a computation for the 20x26 image, to get an image made from the difference of each pixel to its neighbours, in order to normalize the image. After some test, we have notice that working on a blue colour space makes the signal well recognizable (Figure 2).

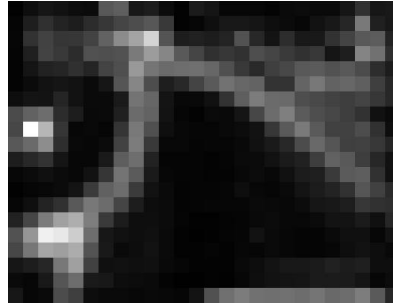


Figure 2. Computation on blue space.

But in others, the presence of white signals on the road, creates a distraction and those pixels are also highlighted (Figure 3).

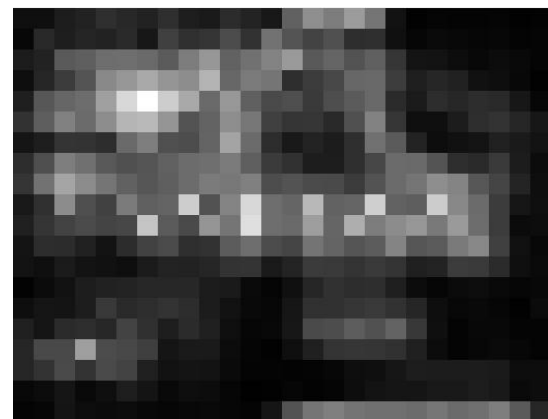


Figure 3. Algorithm input (left). Algorithm output (right).

Considering this kind of situation, we tried to extract only the blob areas with presence of blue. To accomplish such effect, the next transformation is proposed:

$$\text{Only_B} = B - \frac{R}{2} - \frac{G}{2}$$

When this operation is applied, the white details in the image are superseded and the remaining are the areas where a possible blue sign is located, as seen in Figure 4 After this operation, the image is normalized again.

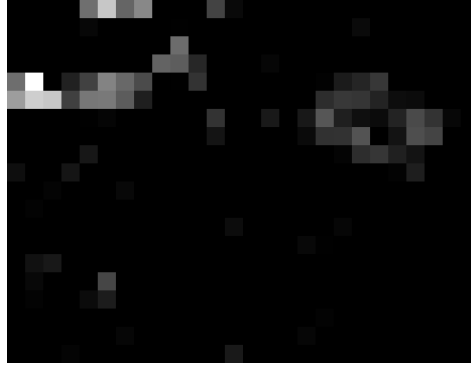


Figure 4. New operation behaviour.

The same method has been also tested with warning signals, like the one in the image. In this case, for the red colour of the traffic sign, a modified version of the expression is used. The following figures (5, 6) show the different results obtained with these algorithms.

$$\text{Only_R} = R - \frac{B}{2} - \frac{G}{2}$$



Figure 5. Sample image.

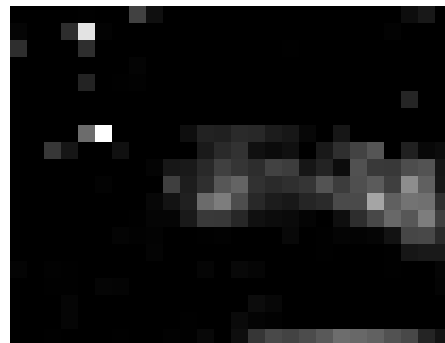


Figure 6. Blue sign detection (left). Red sign detection (right)