Illumination invariant Pre-transformations for Automotive Image Segmentation

1. The Goal:

- Compare already existing illumination invariant image representations
- Establish the influence of adding chromatic components of color space

2. The CamVid dataset:

- 701 labeled images of 32 semantic classes, of which only 11 are used in this problem.
- 960 x 720 RGB images, which are reduced to 480 x 360

Fig. 3: An example image from the CamVid dataset [18] along with its annotations.

3. The Network Architecture:

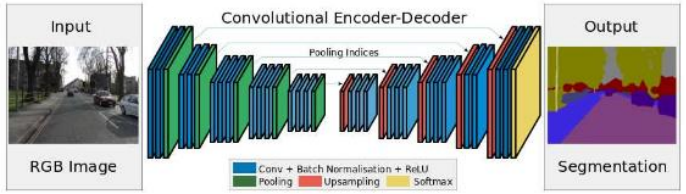

Fig. 4: Architecture of the SegNet Convolutional Neural Network [1].

4. The Illumination Invariant Transforms:

- 4 variations were compared in the paper, 2 were compared by us: Maddern and Álvarez

5. Results:

THEIRS	Class avg.	Global acc.	mIoU	Precision	Recall
RGB	0.61	0.81	0.46	**0.70**	0.61
Maddern	0.54	0.78	0.40	0.64	0.65
MaddernHS	**0.68**	**0.87**	**0.56**	0.69	**0.68**
OURS					
RGB	**0.75**	**0.84**	**0.59**	**0.75**	**0.51**
Maddern	-	-	-	-	-
MaddernHS	0.57	0.64	0.42	0.57	0.31

Results of the Álvarez transform are yet to be determined

6. Results:

- We had to fill in the gaps because of ambiguities in steps taken by the authors
- Our network is trained for less iterations than that of the paper
- There is no way to verify that the transforms yielded the same image as in the paper