

Virtual Billboard

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The coding assignment consisted of implementing code for two functions, namely, est homography and warp pts.

The first of the functions, est homography produced the homography matrix when inputting 4 sets of coordinate points and their corresponding mapping in the projective space.

est homography

Matrix A of size 8x9 was generated as follows:

$$A_x = [-x, -y, -1, 0, 0, 0, x * x', y * x', x']$$

$$A_y = [0, 0, 0, -x, -y, -1, x * y', y * y', y']$$

Every alternate row was created using the above structure.

Now, using the formula $Ah = 0$, h, the required matrix was recognised to be the null of the A vector. Hence h was determined using the svd function. The last column of the 3rd parameter used in the function was taken as h and reshaped to (3,3).

warp pts

The homography matrix was generated by calling the previously defined function.

The coordinates of the given input image were homogenised before premultiplying by the homography matrix H.

The output image matrix was now divided by the third column that consisted of the lambda term. This division converted the points from P2 space to R2 space.

The output image matrix was passed on to the main function that applied the homographic projection to every frame of the video.

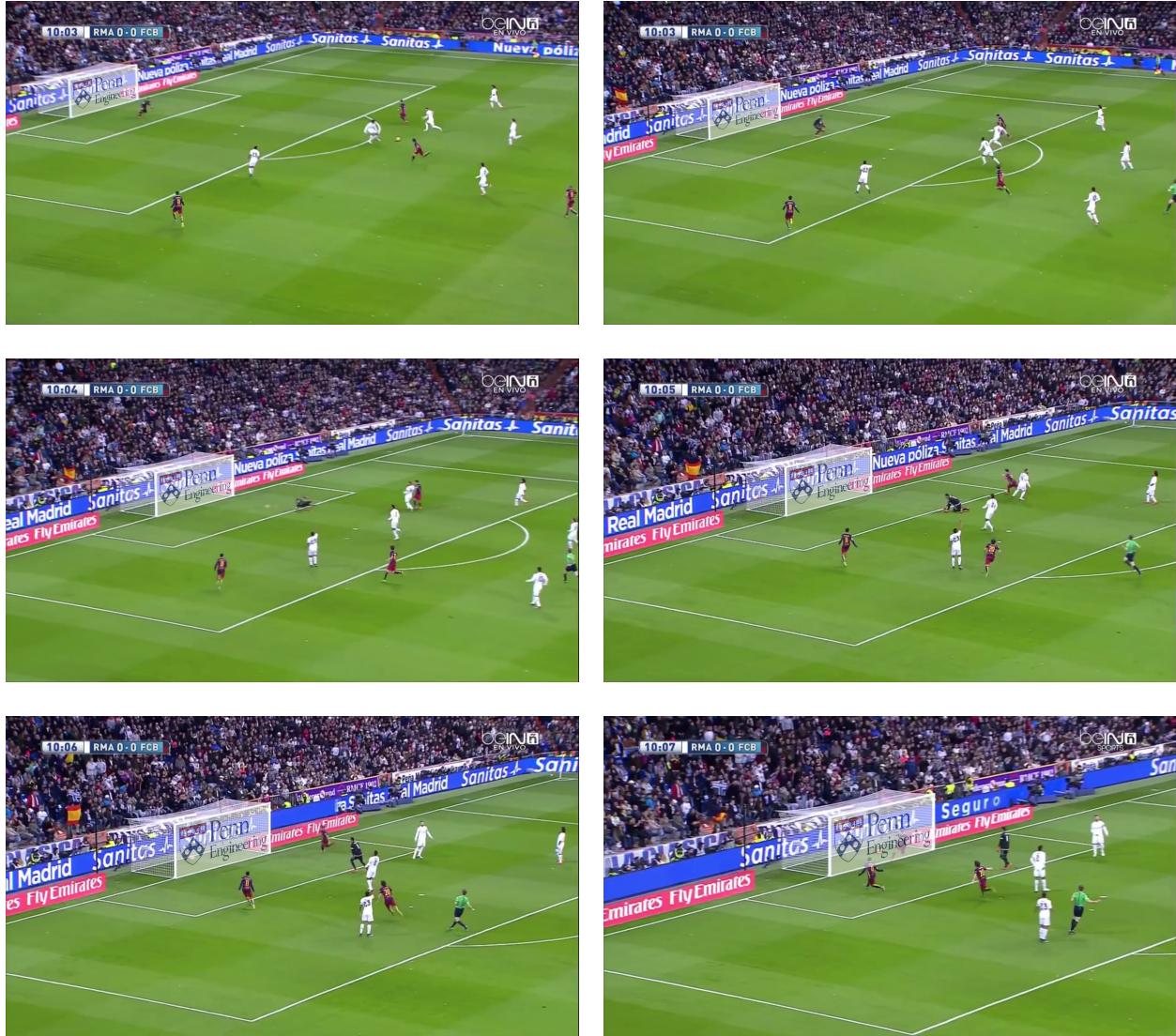


Figure 1: Implementation of Virtual Billboard - Framewise representation