

COMPUTER VISION

**DOUBLE DOUBLE DOMINO AUTOMATIC
GRADING**

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Rares Patrascu

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Chapter 1

Template Creation

The template was created using the 02 image from the board and dominoes folder respecting this steps.

1. First, I cut out the matrix on which the dominoes were placed as best as I could.
2. Then I made perspective correction using opencv with manually obtained points using a site that allowed me to zoom in on the image and choose certain pixels to be used as source points.

The template obtained was used to align all the images

Chapter 2

Image allignment

The images were aligned using the technique from laboratory 4 but with small modifications. A main change is that we used the ORB algorithm instead of SIFT because it is much faster but has a similar accuracy.

Chapter 3

Patching

The aligned images we're patches the same as in lab2. Note that patches we're cropped bigger with 12 pixels in each side to assure that they can be predicted on.

Chapter 4

Classification

Classification was done in 3 steps.

1. First split all the patches in domino or not domino with respect to how much black and white they have
2. Secondly detect dircles on them using hought circles.
3. last phase classify them based on the number of circles.

Note that in the first phase we also got the middle patches as dominoes bc of the board. This is later resolved comparing how much white have patches with 0 circles.