The testing was aimed to measure the accuracy of system on user's interest region prediction.

First prototype that used image processing to localize the iris center had MAE of 500 pixels, which is about 25% of the screen. Therefore, it was decided to work on increasing the accuracy.

The factors contributing to the system's overall accuracy are:

1) The accuracy of model that maps the 3D geometry data of eyes location and gaze to the interest point.
2) The accuracy of model that localizes the center of iris on image.

As mapping in 3D geometry is more general and straightforward process, it should have relatively low error. So, the main focus was to create an alternative for image processing method of iris center localization.

The new model for that purpose was trained with 1000 manually labelled images. It had MSE of 2 pixels in iris center localization, in contrast to 5 pixels of previous method. The change of several pixels in iris center leads to the significant change in the gaze direction in 3D geometry calculation.

Model architecture:

Convolution, filters = 64, kernel size = (3, 3), activation = leaky relu

Convolution, filters = 128, kernel size = (3, 3), activation = leaky relu

Convolution, filters = 256, kernel size = (3, 3), activation = leaky relu

Dense, filters = 256, activation = leaky relu

Dense, filters = 2, activation = softmax

All of the models were made with generalized approach, so all of the images are preprocessed to remove unnecessary feature. That preprocessing includes conversion to greyscale and histogram equalization. The right eye images were flipped horizontally and combined with data of left eye.