

## **Abstract**

Eye movement-based biometrics has become a new field of research. Eye movements like fixations and saccades are unique in nature to each person which helps to identify them accurately. Eye movements are different gender-wise which supports eye movements based gender prediction. The existing eye movement pipeline has predicted accuracy for user as well as gender prediction on different datasets with equal importance to fixations and saccades. So the aim of this thesis is to improve the overall accuracy by using different ensemble approaches. The ensemble will be given the predicted probability values from the base classifiers. Thus the output of the base classifiers becomes the input of the ensemble classifier. Then with different combining strategies, the ensemble tries to improve the overall classification accuracy. With this, the thesis also tried to find whether any one of the fixation or saccades can have more importance when predicting user and gender on different datasets. This is done by giving different combinations of weights with one being of higher weight than the other. The thesis results show that the ensemble with the existing classifier models cannot improve the accuracy rather the accuracy values are going below the previous best accuracies due to various reasons. One of the reasons that were observed is that the base classifiers not being diverse enough with each other. While the weighting results for user predictions show that both combinations of higher fixation and saccade weights improve the accuracy. In gender prediction, the combination of higher fixation movements lead to improvement of accuracy. Thus ensemble techniques can guarantee improvement of the results when the base classifiers are not similar to each other and in user prediction, both fixations and saccades are equally important while for gender prediction fixation proves to have more importance due to different eye movement patterns of males and females.