eye movement biometric recognition Version 2

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Abstract

Protocal for eye movment biometric recognition

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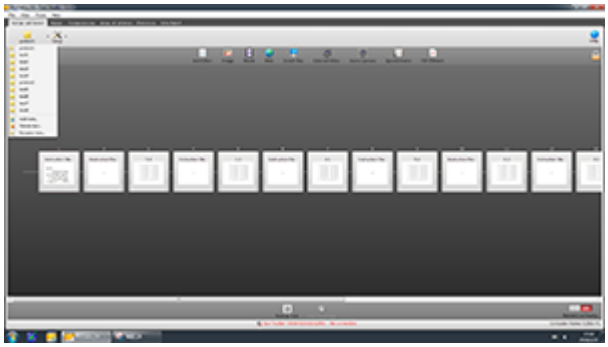
Protocol

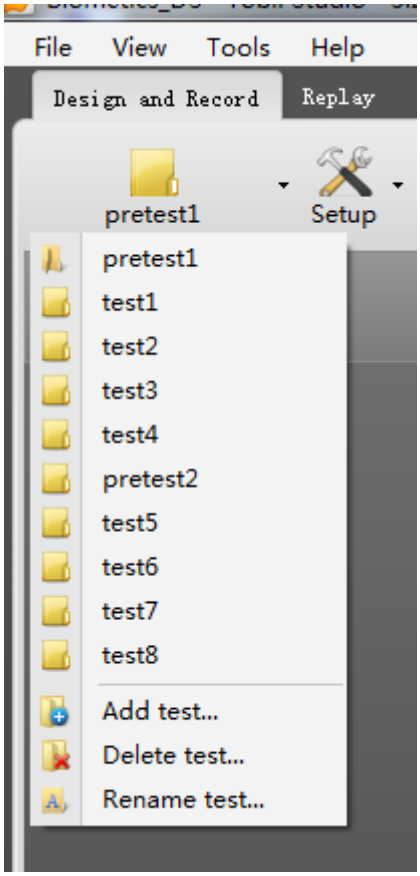
Visual searching task and data collection test design

Step 1.

1. Design the visual searching task with HTML, which wil be used in the practice part

2. Design the data collection test





Eye movement data collection

Step 2.

Eye movement data collection procedure is the same for every participant.

1, Practice visual searching task with the HTML visual searching task (at least 40 questions).

2, Collect eye movement data with trial1 (pretest1, test1, test2, test3, test4) of the data collection test.

After two weeks

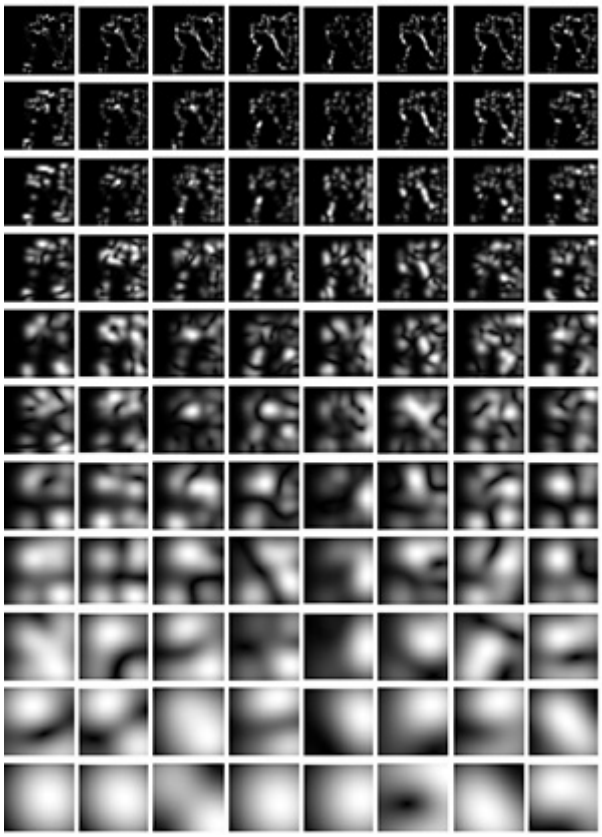
3, Collect eye movement data with trial2 (pretest2, test5, test6, test7, test8) of the data collection test.

Feature extraction

Step 3.

1, Draw the eye movement trajectory pictures with raw gaze data.

2, Get texture map of these eye movement trajectory pictures with Gabor wavelets.



3. Calculate the mean and varience of these texture maps, these values are the characteristic values.

Feature recognition

Step 4.

1, Calculate the intrinsic dimension of the 176 texture features based on the ‘maximum likelihood’

(ML) algorithm.

2, Reduce the demension of textrure features to its intrinsic dimension with the ‘linear discriminant analysis’ (LDA) algorithm.

4. Train (n-1)*n/2 SVM classifiers with training datasets (70% of toltal dataset) (the n is the number of participants).

5. For verification scenario, an unclassified test feature will be classified with n-1 SVM classifiers to determine whether it belongs to a participant or not.

For identification scenario, an unclassified test feature will be classified with (n-1)*n/2 to determine which paiticipant it belongs to.