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Updated on Sept. 14, 2007 by Yang

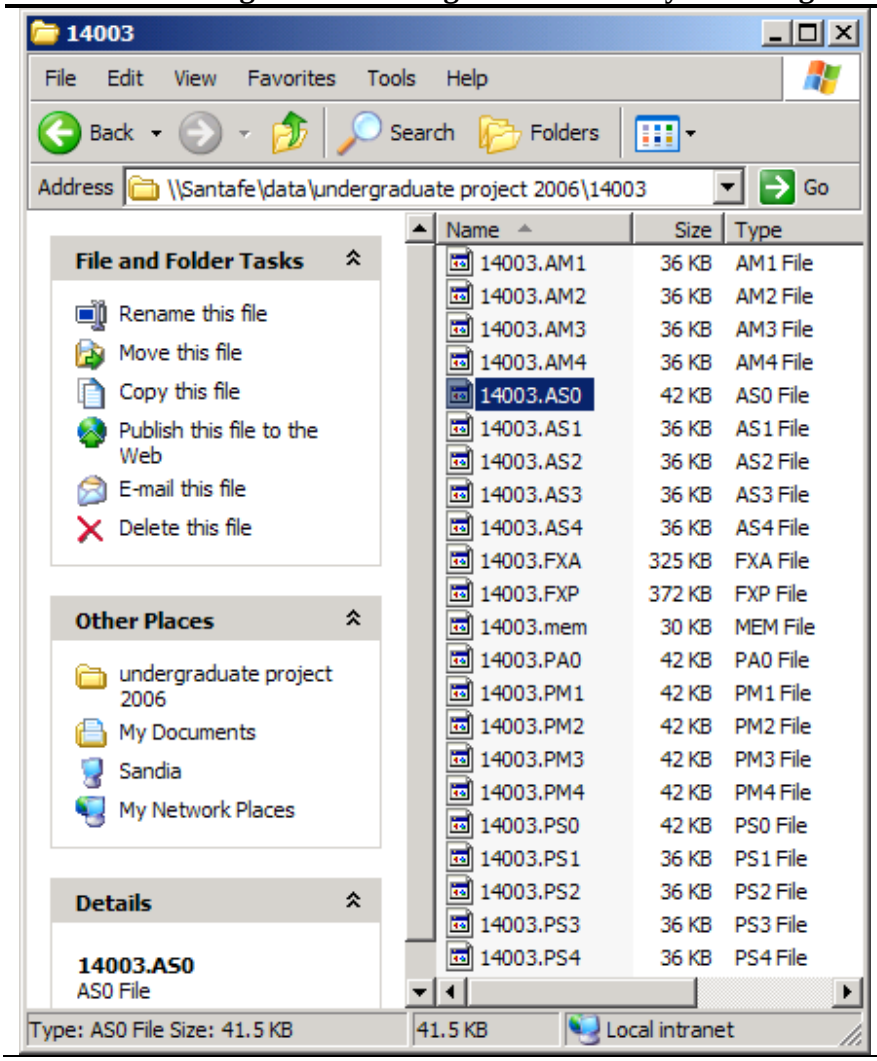
Instructions for eye movement data scoring

– How to score data collected from 6th floor lab.

The best computer to use for scoring is the second windows machine in the sixth floor.
The URL of the logfile is : http://docs.google.com/Doc?id=ah7wxkpq3656_33d47ms6

I Files

1 DATA files: **We get the following files from the eye tracking computer:**



D:\undergraduate project 2006

File name:ID#.Condition type
e.g. 14003.AM1

Condition type:

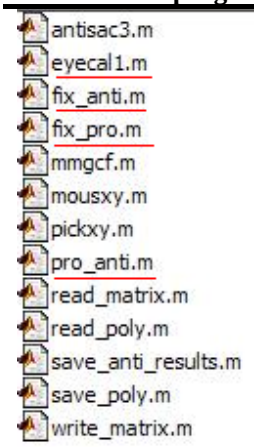
.AM1~ .AM4 = Anti in Pro/Anti
.PM1 ~ .PM4 = Pro in Pro/Anti
.AS1 ~ .AS4 = Anti in Fix/Anti
.PS1 ~ .PS4 = Pro in Fix/Pro

1 ➔10 degree left
2 ➔ 5 degree left
3 ➔ 5 degree right
4 ➔ 10 degree right

PA0 = calibration in Pro/Anti
AS0 = calibration in Fix/Anti
PS0 = calibration in Fix/Pro

2. Matlab ".m" files

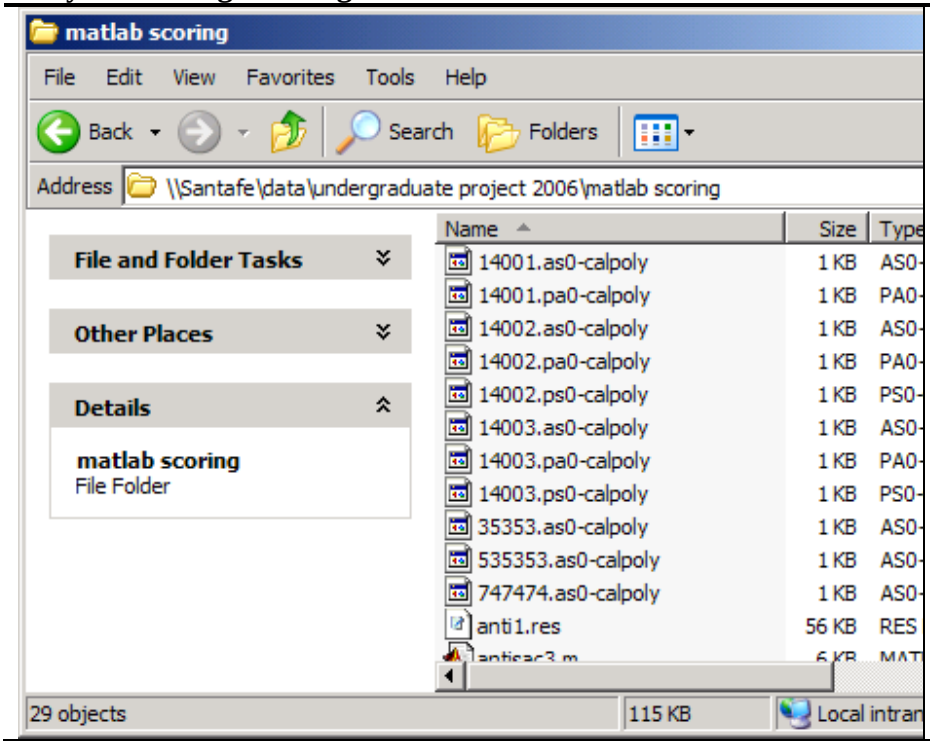
We have one program to score each one of the runs, and one program to score ALL calibrations



In D:\undergraduate project 2006\matlab scoring
Eyecal1.m ➔ for calibration
Fix_anti.m
Fix_pro.m ➔ for eye movement
Pro_anti.m

3 Result files

All your scoring results go to: anti1.res



Folder: D:\undergraduate project 2006\matlab scoring

- *-calpoly: calibration results

II Data Scoring steps:
Here we use “fix/pro” task as an example.

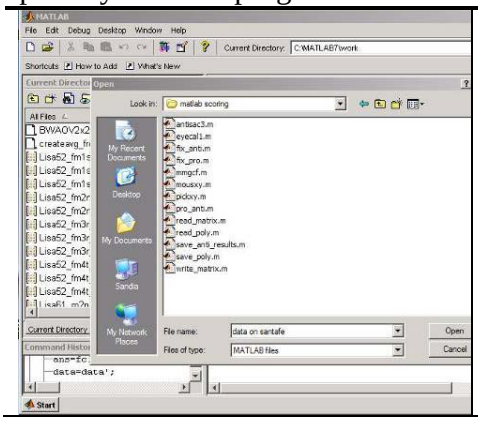
1. Preparation before scoring
   1.1 Check the scoring log book to make sure where to start.
   1.2 Make sure the data you are going to score are in the right directory;

2. Calibration scoring, need to score calibration for each run.

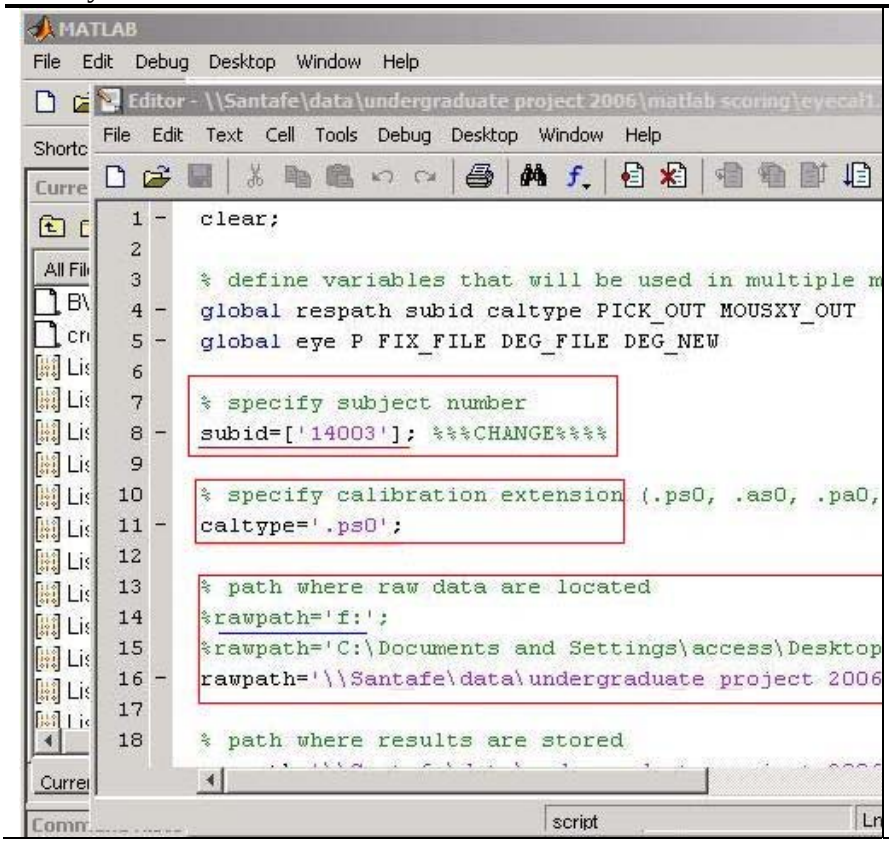
2.1 Open Matlab 7.0 program

	Double Click the Icon of “MATLAB” 7.0 on desktop

2.2 Open “eyecal1.m” program in Matlab

	-Go to **MANUAL=>File=>Open or**  then -Click “D drive >> undergraduate project 2006>>matlab scoring>> Eyecal1.m” -An Editor window will open

2.3 edit “eyecal1.m” in Editor window



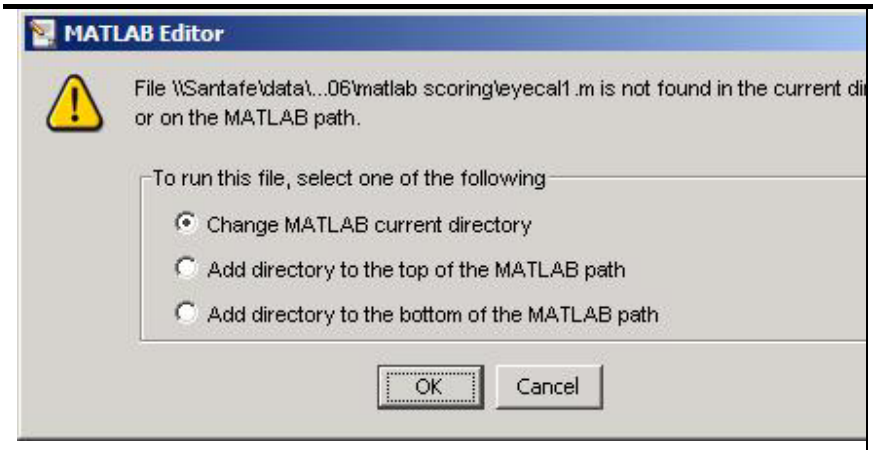
-change line 8 “subid” to the right subject ID

- change line 11 “caltype”. For Fix/pro, we choose ‘.ps0’ here.

-check line 14 “rawpath”, make sure the path is **D:\undergraduate project 2006\matlab scoring** *[no % in front of it];*

-**Save!**

2.4 Run program

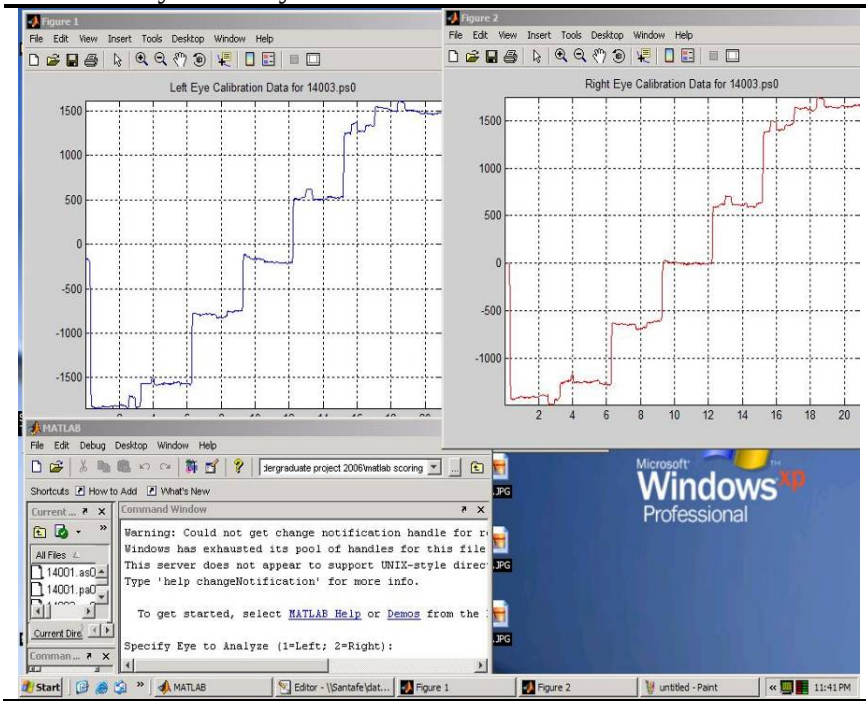


-click  to run program

-If the popup window on the left shows, just click “OK”. This is to specify the path we are using.

-This window only shows up the first time you start scoring.

2.5 select eye to analyze

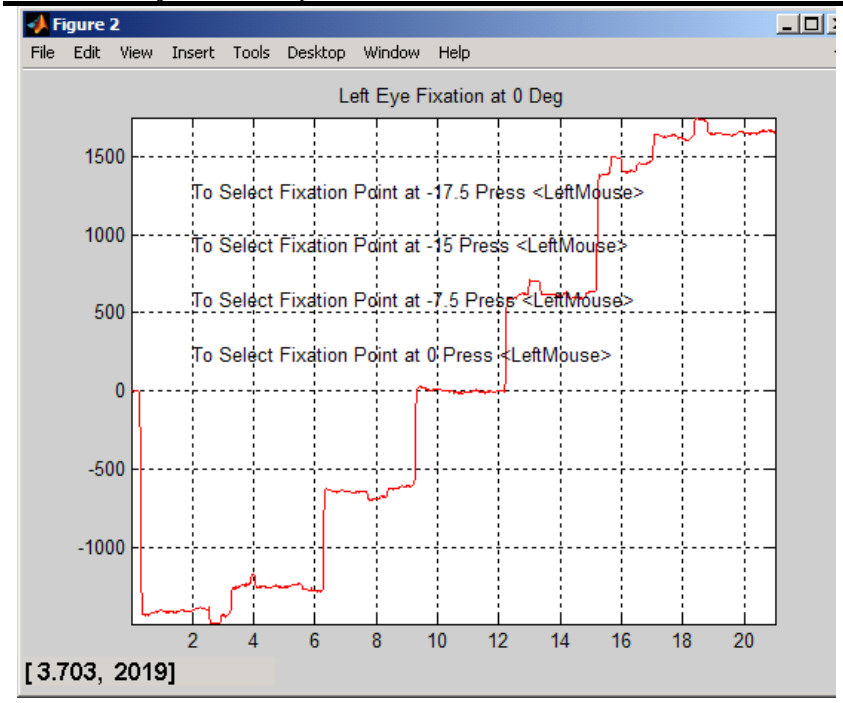


-2 new windows open up (figure 1 and 2)
=-=-=-=-=-=
- Fig 1=left eye [blue line]
- Fig 2=right eye [red line]
-=-=-=-=-=-=-

- specify eye to analyze (1=L;2=R)
- always pick the eye that you can clearly see 7 steps.
- also check the log book,
- in Matlab window press 1 or 2, then press "Enter"

-If you make mistakes here, press "ctrl+c" to terminate the program, Then restart with **step 2.4**

2.6 select eye fixation points



- Please follow the instructions on the Figure 2
- use the left button of the Mouse to select fixation points, make sure that you click on the horizontal part of the lines.

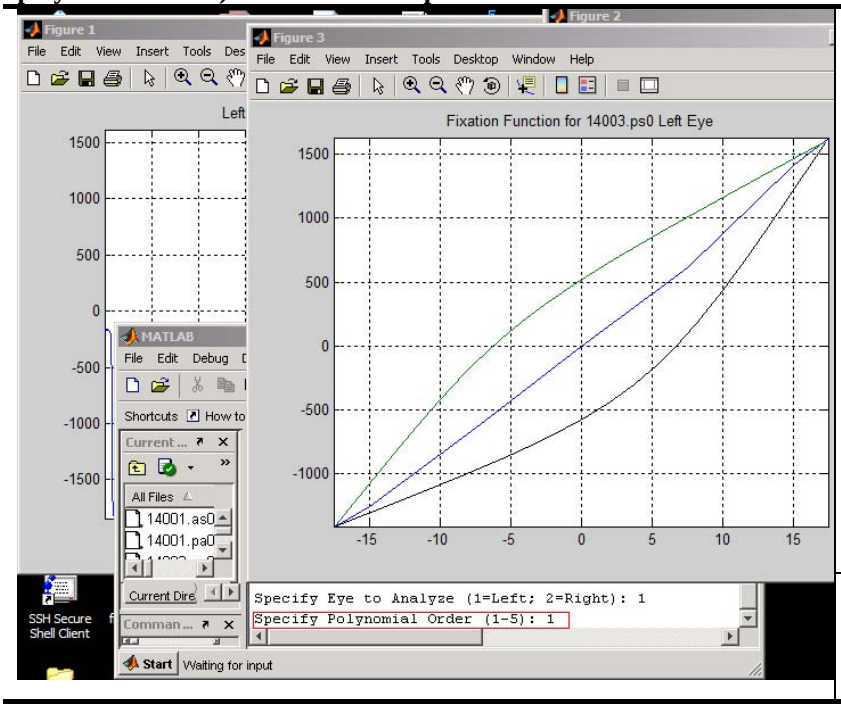
- from far left to far right, 7 points in total

- **Figure 3** shows up after you choose 7 fixation points. (see **step 2.7**)

-If you make mistakes here, press "ctrl+c" to terminate the program, Then go back to **step 2.4**

2.7 **Specify polynomial order**

Figure 3 plots a line with the points you chose for each of the seven steps. If the points are perfect, there would be a straight line. The program asks you to describe the line (using polynomial order) to better come up with a model of the calibration.



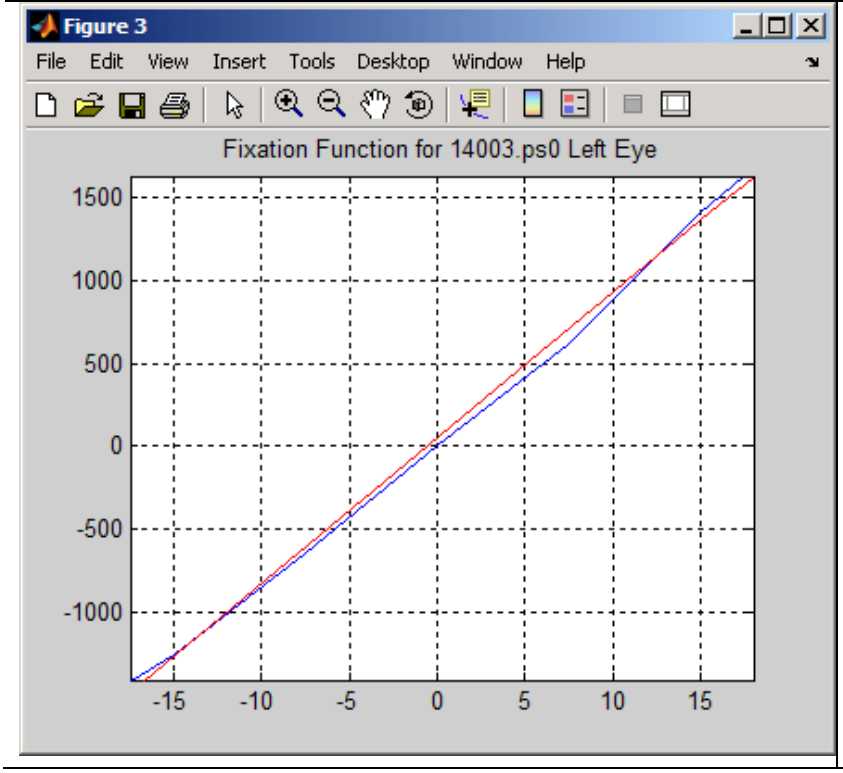
- fig 3 shows up with only **one line** in it (in the picture on the left, the green, blue and black lines are added to show all possible conditions)

-Specify polynomial order:
-if the line in fig.3 is like the Blue one, press 1 and then "Enter".

-if the line in fig.3 is like the **Black one** or Green one, press 2 and then "Enter".

-If you make mistakes here, press "ctrl+c" to terminate the program, Then go back to **step 2.4**

2.8 Confirm **polynomial order**



- After you press the description for the line (1 or 2), a red line will show in fig 3.
- A file named "14003.ps0-calpoly" is saved in the results folder at the same time.

- Make sure the red line is close enough to the blue line.

- If they match, then the calibration scoring is done. Close all the figure windows.

-If they do not match, close all the figure windows, and repeat the calibration scoring by going back to **step 2.4**

2.9 Calibration scoring is done! DO this for all three runs. Remember to write it down on the log file. ☺

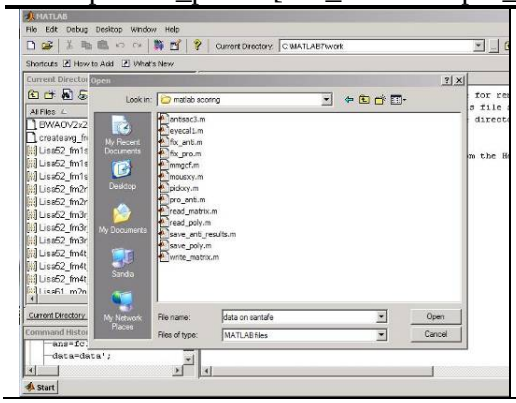
3 Scoring eye movements

[Here we use “Fix/Pro” as a sample, but the steps for “Fix/anti” and ”Pro/Anti” are the same]

3.1 Run Matlab 7.0

Double Click on “MATLAB 7.0” icon on desktop

3.2 Open fix_pro.m [fix_anti.m or pro_anti.m for corresponding runs]

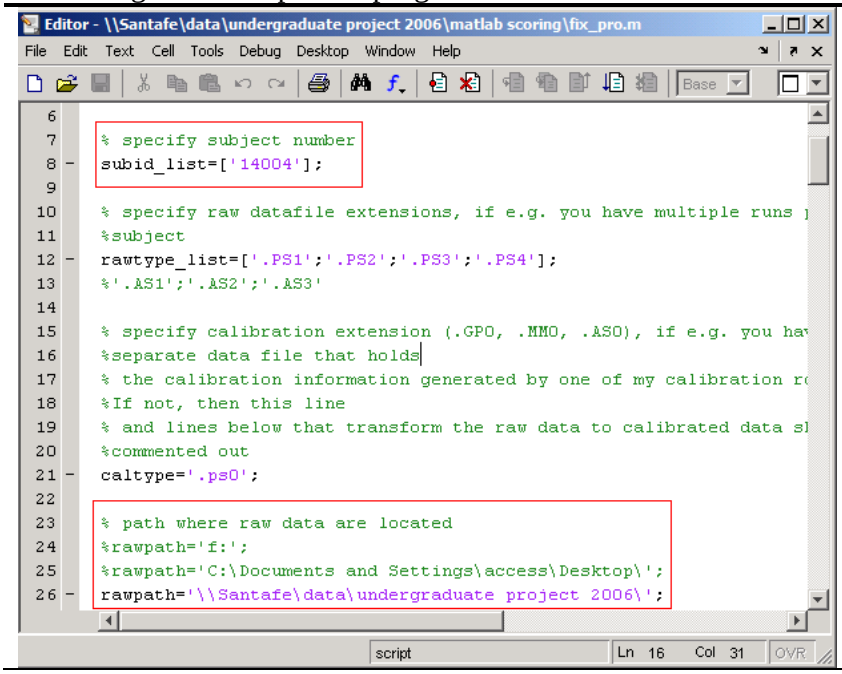


-Go to **File=>Open or** 

-go to “D:\ dirve >> undergraduate project 2006>>matlab scoring>> **fix_pro.m** ”

-An editor window will open

3.3 Change the “fix_pro.m” program in the Editor window



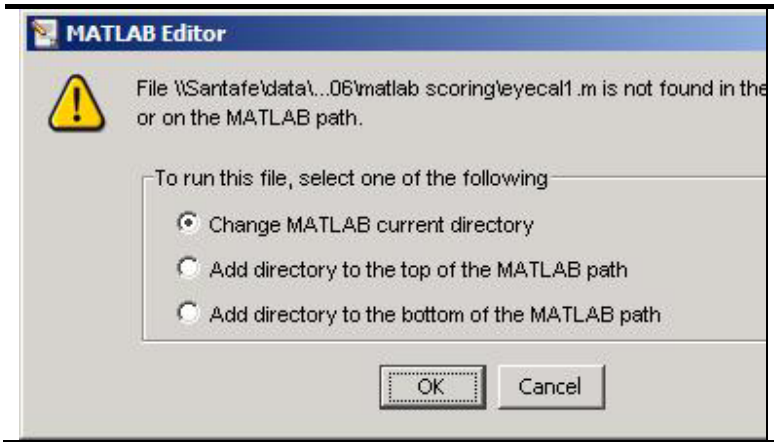
-change line 8 “subid_list”

-check line 24 “rawpath”

Line 24 should be rawpath=’d:\undergraduate project 2006’; please make it uncommented and make sure other lines here is commented

-**Save!**

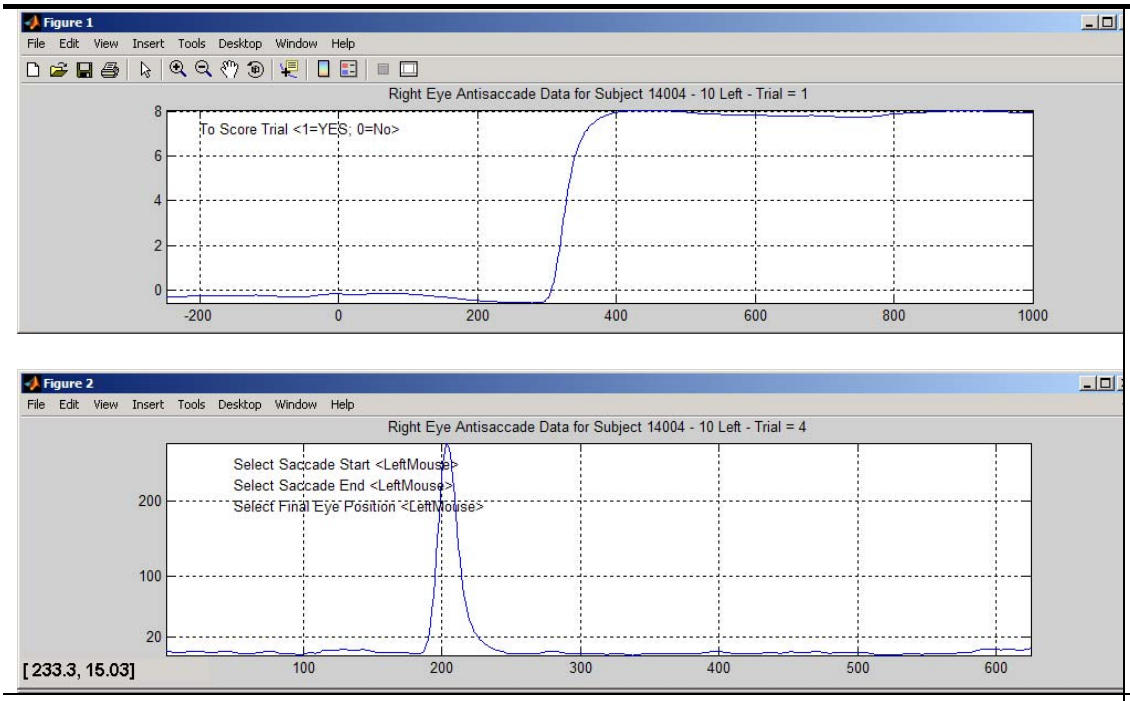
3.4 Run program



-click  to run program

-If the popup window on the left shows, click “OK”.

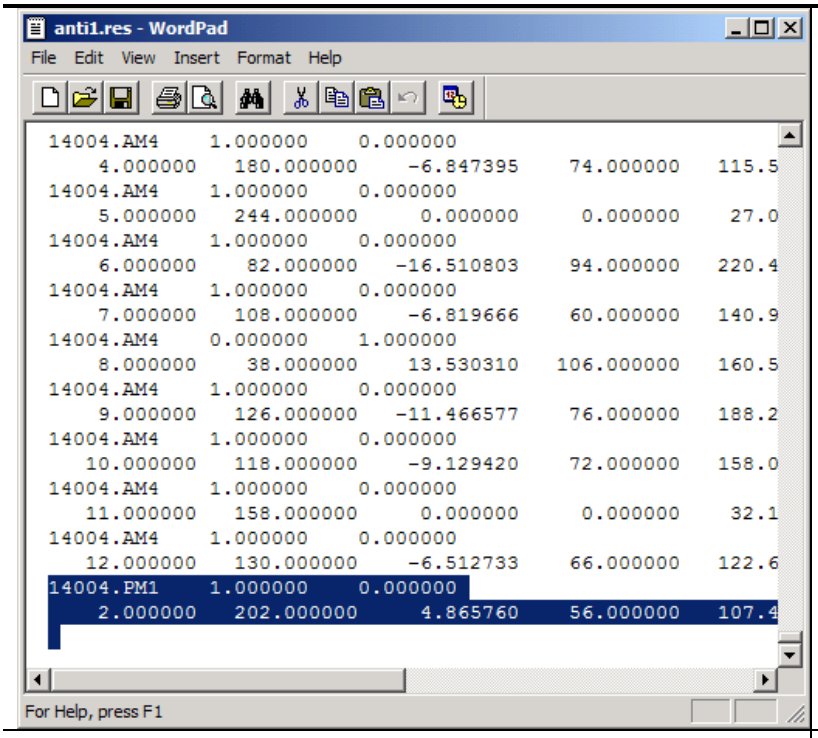
3.5 Score data



- Figure 1 (eye position) and Figure 2 (eye velocity) will appear, arrange them the way shown above (try to align them)

- Fig 1: Answer the questions show on figure 1. Use keyboard: [See part III]
- Fig 2: Select eye movements’ start point, end point and final eye position. Use Mouse: **[See Part III for more details]**
-if you did not make any mistake, the program will save the result of this trial into the file “anti1.res”, and then start next trial automatically. Please keep going until you finish scoring this task. Then go to **step 3.8**
- If you make a mistake here, please make sure you know the trial number, go to **step 3.6 and 3.7.**

3.6 "Error correction" 1



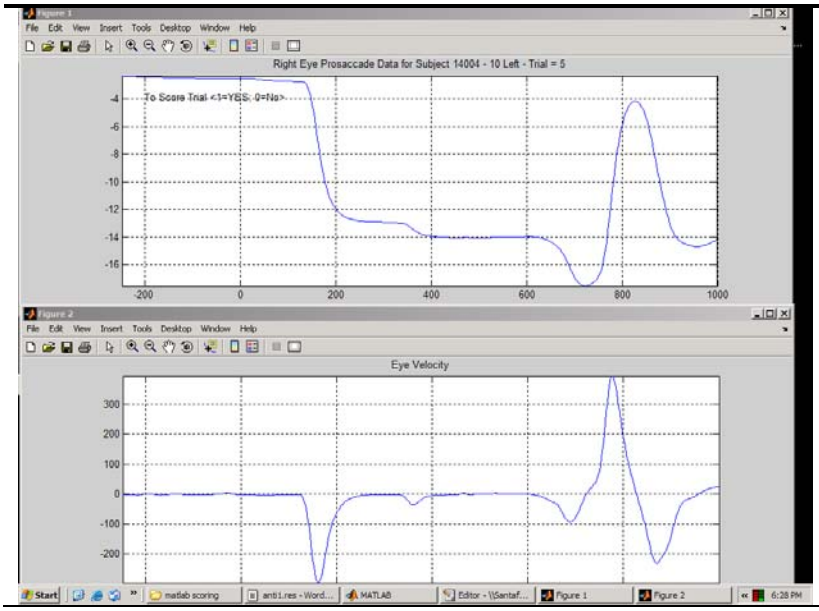
If you make a mistake on step 3.5, you should:

- Stop the program by entering "Ctrl+c" in the Matlab window
- Open the file "anti.res", and scroll down to the very last line of this file.
- Check if the trial in which you made a mistake was saved.
- If it is saved, delete it, then go to the editor window and run the program again.

Only delete the wrong one

-if it is not saved, go to the editor window and run the program again.

3.7 "error correction" 2



- Press "Enter" to skip the trials which were correctly scored and find the one you made mistake to.

- Redo it

3.8 You finished this one! Congratulations! Do not forget to write it down on the log file.

III. Trial scoring

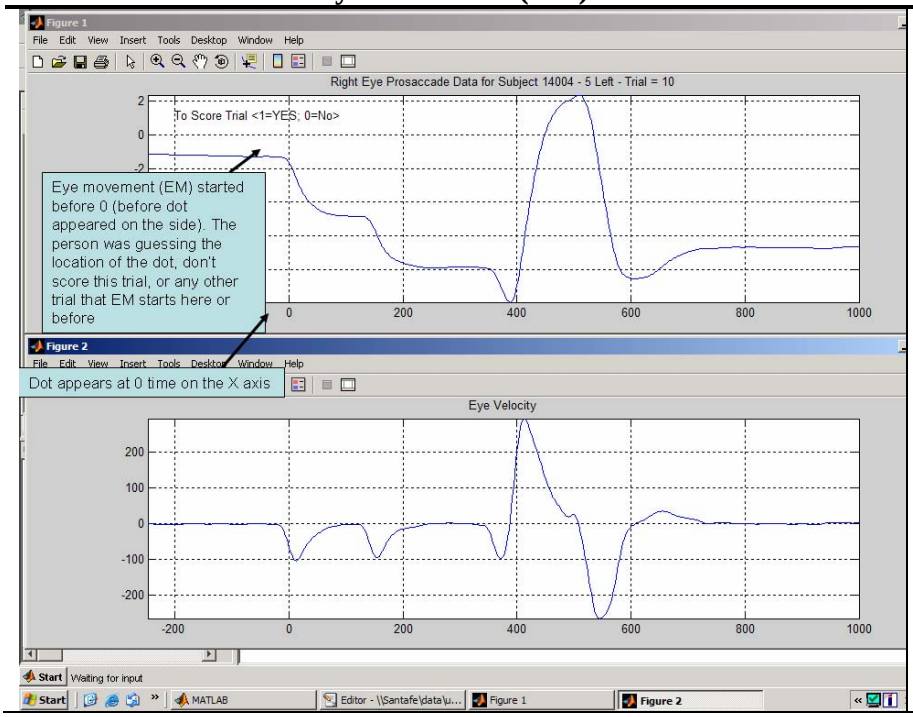
1. First check the type (Prosaccade or Antisaccade) and correct direction of eye movement (right or left)
2. The program will ask you if you **want to score the trial**. Possible reasons why you should not score the trial:
    a. If eye movement started before the presentation of the peripheral cue (at time zero, see #1 in Possible Scenarios).
    b. If there is a blink (big peak) during the eye movement.
    c. If the person did not respond during the trial (straight line or crazy data)

    If you DO want to score the trial, press 1 in the Matlab window, if not, press 0 and then ENTER.
3. The program will ask you if the trial was **correct or wrong**.
    a. If the trial was a prosaccade to the right, the line graph should go up
    b. Prosaccade to left: line should go down
    c. Antisaccade to right: line should go down
    d. Antisaccade to left: line should go up

    If the data is fine, press 1 in Matlab window, if not, press 0 and then ENTER.
4. If you **pressed 1 because the trial is correct**, the program will ask you for:
    a. Saccade start: the first eye movement towards the desired location (needs to be when line crosses 20 deg).
    b. Saccade end: when the line crosses back the 20 deg position.
    c. Final eye position. This is the point where the person kept their eyes at the end of the eye movement. Always look for the most stable point after the eye movement. (See # 7 and 8 in Possible Scenarios)
5. If you **pressed 0 because the trial is wrong**, the program will ask you for:
    a. Saccade start: same as in 4a
    b. Saccade end: same as in 4b
    c. Final eye position. This is the point after the person did the correction, where the person thought was the right position, so it should be at the very end.
    d. Score Error correction: this is the next eye movement that the person does to try to move the eyes to the correct location.
        i. If the person did try to correct the eye movement, press 1
        ii. If there is not error correction (eye stayed in the wrong position the rest of the trial), press 0
    e. Error start: when line showing eye position crosses 20 deg line during eye movement correction.
    f. Error end: when line showing eye position crosses back the 20 deg line.
6. After you have done number 4 or 5, the program saves the present scored trial in "anti1.res".

Possible scenarios

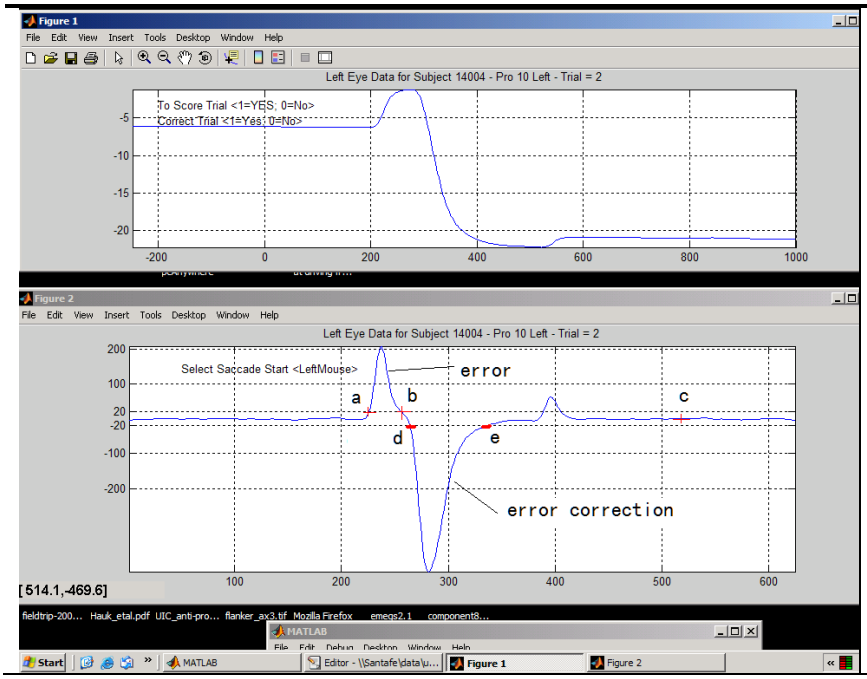
1. Not scoreable trial: Eye movement (EM) started before 0



Eye movement (EM) started before 0

-Score? **No**

2. Prosaccade Error



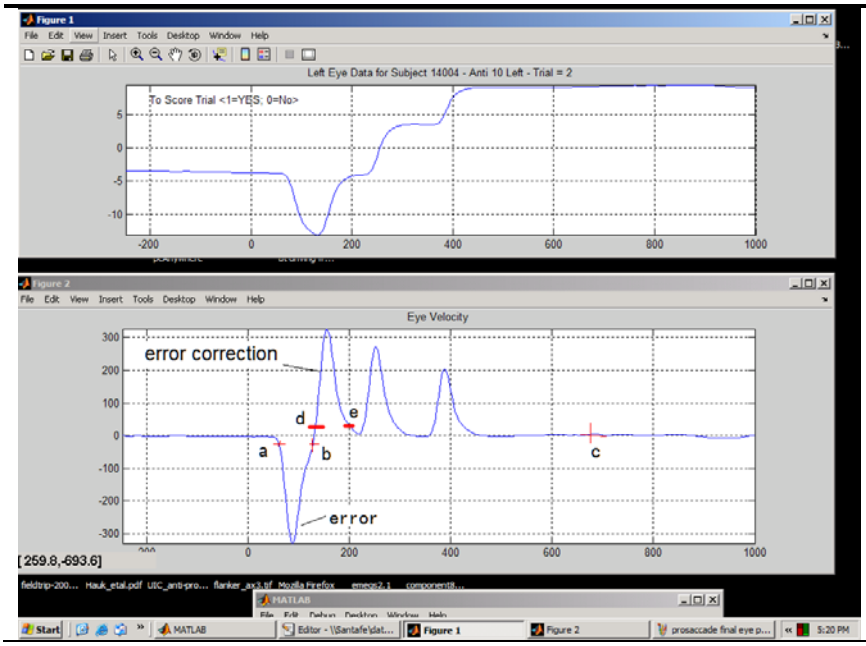
prosaccade error

-Score**? Yes**
-Correct**? No**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

-error correction?**yes**
- correction start? **d**
- correction end? **e**

*** all a,b,d,e should be in line with (±)20 degree**

3. Antisaccade Error 1



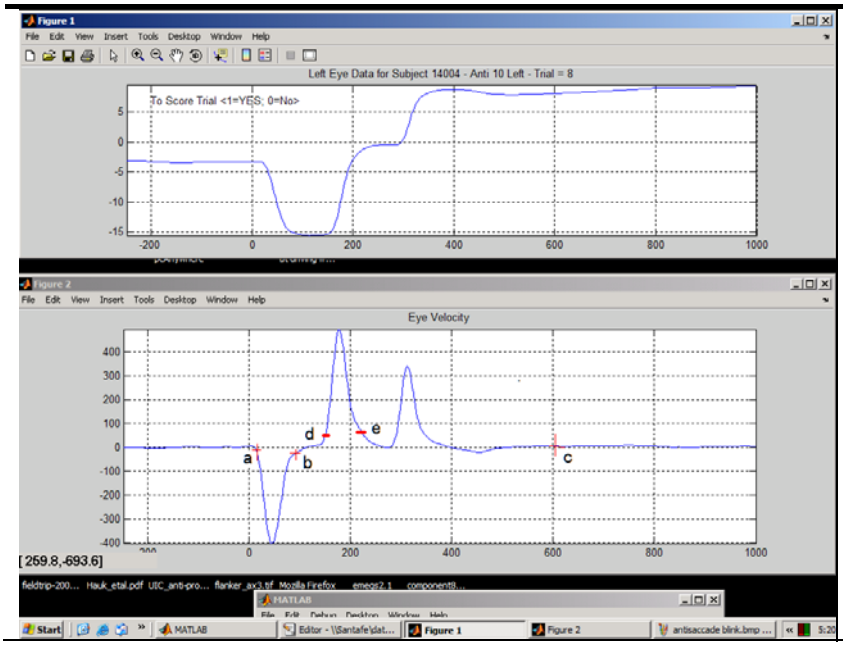
antisaccade error

-Score**? Yes**
-Correct**? No**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

-error correction?**yes**
- correction start? **d**
- correction end? **E**

*** all a,b,d,e should be in line with (±)20 degree**

4. Antisaccade Error 2



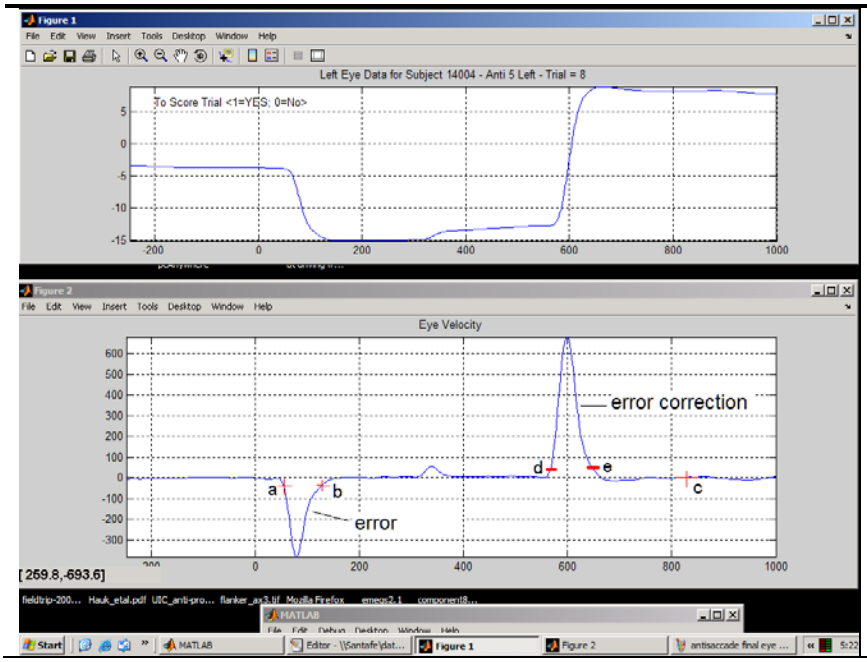
antisaccade error

-Score**? Yes**
-Correct**? No**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

-error correction?**yes**
- correction start? **d**
- correction end? **E**

*** all a,b,d,e should be in line with (±)20 degree**

5. Antisaccade Error 3



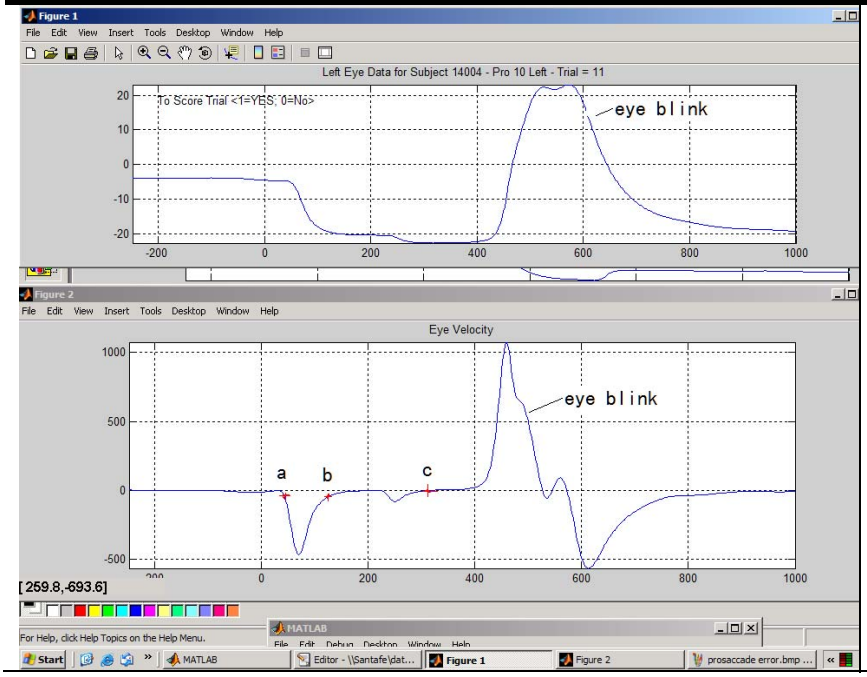
antisaccade error

-Score**? Yes**
-Correct**? No**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

-error correction?**yes**
- correction start? **d**
- correction end? **E**

*** all a,b,d,e should be in line with (±)20 degree**

6. Blink during Prosaccade Trial

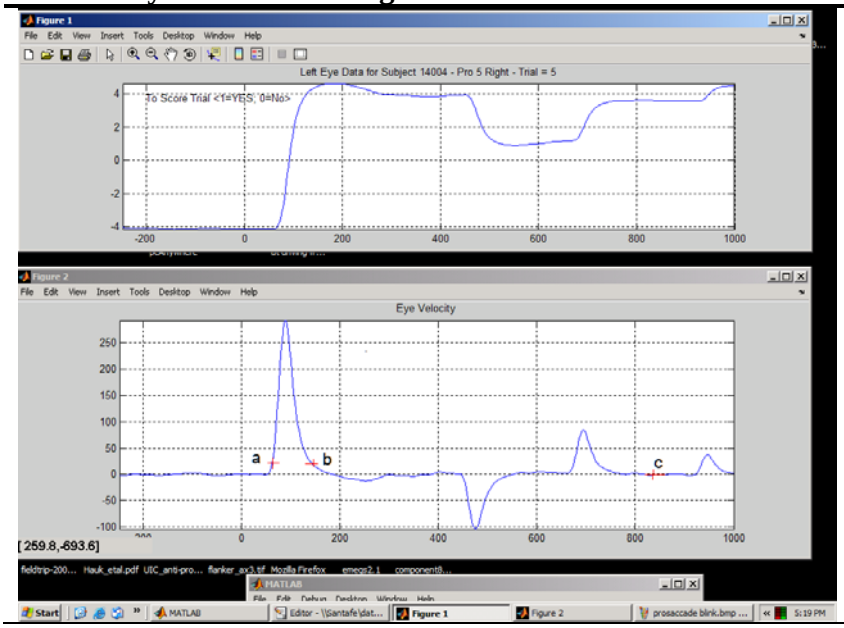


Eye blink after eye movement

-Score? **Yes**
-Correct? **Yes**
-saccade start? **a**
- saccade end? **b**
-final eye position? **C**

*** all a,b should be in line with (±)20 degree**

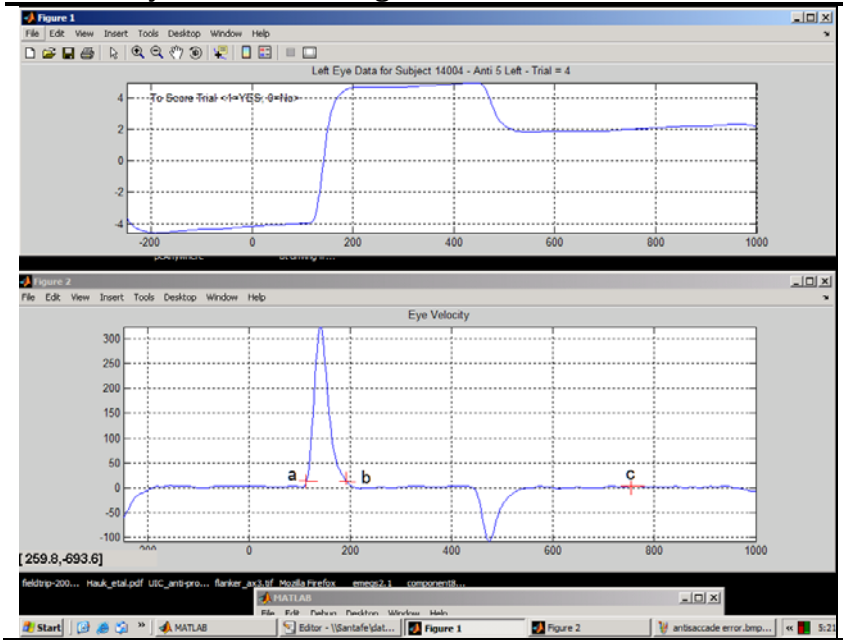
7. Final Eye Position During Prosaccade Trial



Unstable position of eye after response

-Score**? Yes**
-Correct**? Yes**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

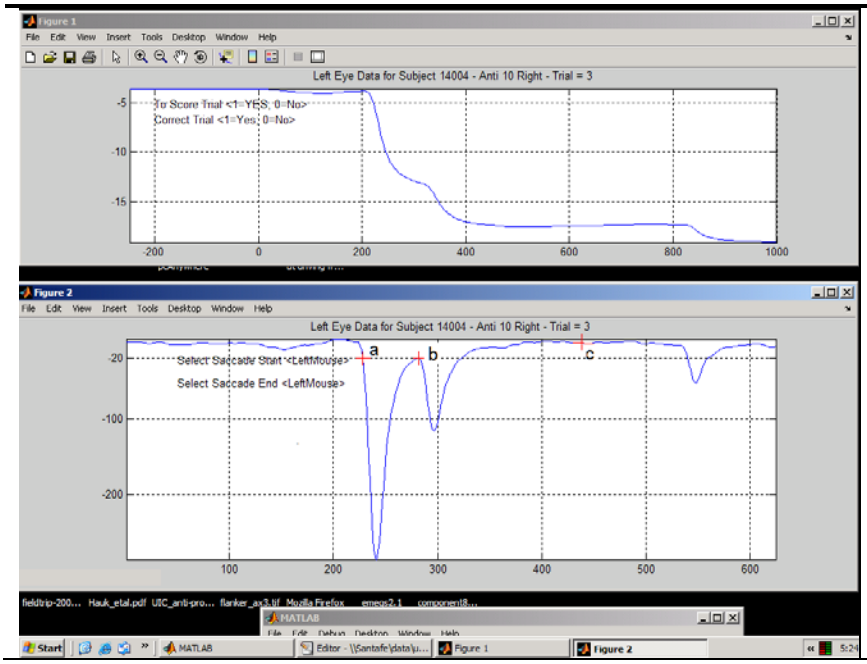
8. Final Eye Position during Antisaccade Trial



final eye position was adjusted

-Score**? Yes**
-Correct**? No**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

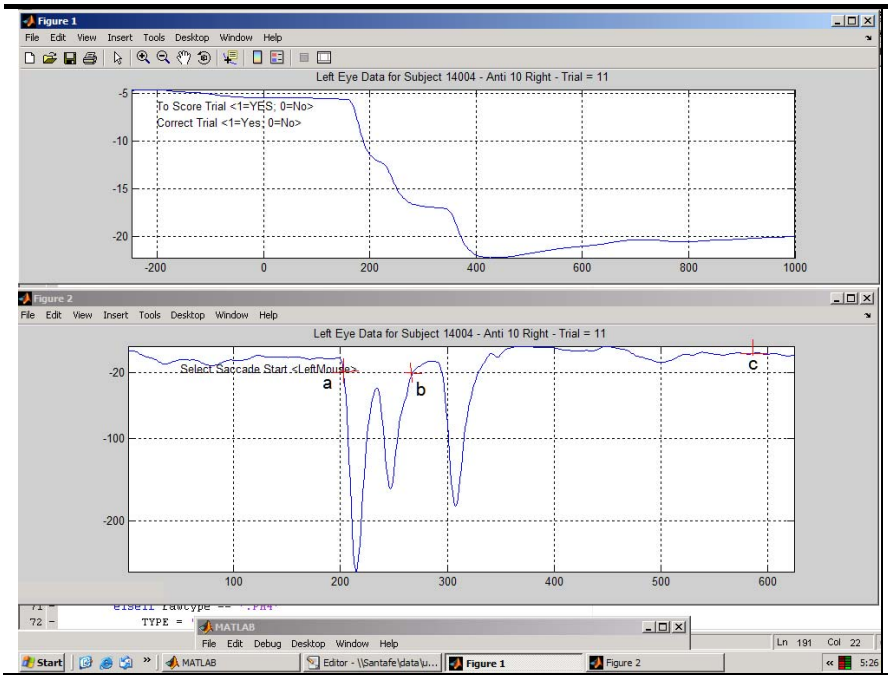
9. Antisaccade



Antisaccade, eye movement in two steps, score the first part of the eye movement that crosses 20 deg.

-Score? **Yes**
-Correct? **Yes**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**

10. Antisaccade



Antisaccade, eye movement in three steps, score the first part of the eye movement that crosses 20 deg.

-Score? **Yes**
-Correct? **Yes**
-saccade start? **a**
- saccade end? **b**
-final eye position? **c**