

DESIGN AND REALIZATION OF AN APPLICATION FOR MEASURING RESPONSE TIME TO VISUAL STIMULUS

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ABSTRACT: This paper presents how an application is made, using several front-end programming languages, to measure a person's response time to visual stimuli. The results obtained for 20 people who participated in this experiment, generated by the created application, were presented.

KEYWORDS: reaction time, visual stimuli, computer application.

1. Introduction

Reaction time defines the time interval between the stimulus and the moment of response to the stimulus. [1]

This concept has been widely studied because its practical implications can be of great consequence, e.g. a slower than normal reaction time while driving can have serious results. Many factors have been shown to affect reaction times, including age, sex, physical condition, fatigue, distraction, alcohol, personality type, and whether the stimulus is auditory or visual. [2]

The purpose of this paper is to measure the reaction time of a human after being exposed to a visual stimulus, by means of a web page type computer application.

2. App concept

In this step, a web page was created using the programming languages HTML, CSS and JavaScript, which measures the reaction time from when the visual stimulus is displayed until the response is received. Each time the subject clicks, the web page will change its state.

When the web page is launched, it will display the first status, which contains the name of the application and its operating instructions. (Fig. 1)



Fig. 1. The startup state of the application

After the user clicks the mouse, the state of the application changes and the web page displays a red background, a sign that the visual stimulus is about to be exposed (Fig. 2):

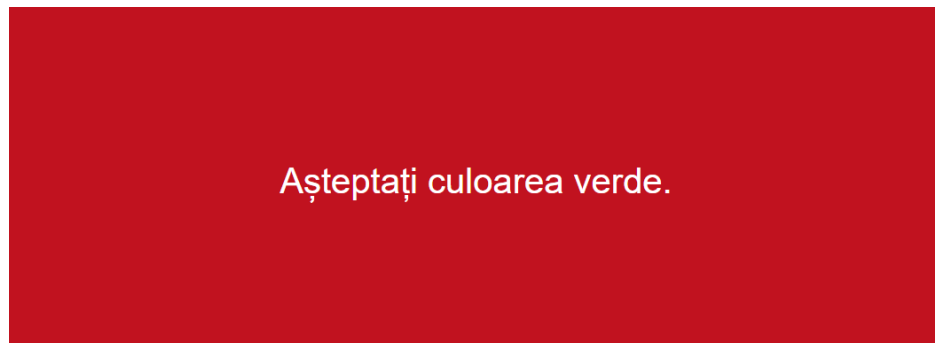


Fig. 2. Visual stimulus waiting state

When the stimulus wait state is displayed, the app generates a random number between 4 and 7 that represents the duration of the wait state view. After this duration has elapsed, the state changes again and the visual stimulus is exposed. (Fig. 3)



Fig. 3. Display state of the visual stimulus

At the moment when the stimulus is displayed, the subject has to press the left mouse button as soon as he notices the appearance of the stimulus. The application will calculate the difference between the time the green color is displayed on the screen and the time the response is received from the user, and this result will represent the reaction time of an attempt. (Fig. 4)

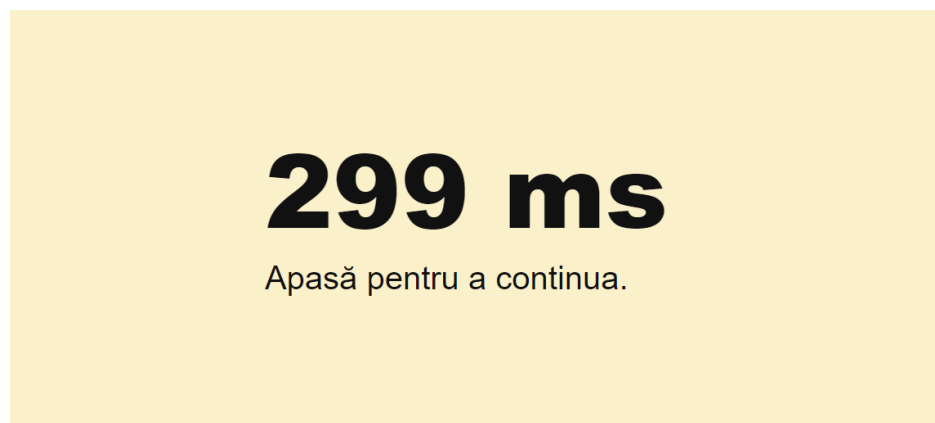


Fig. 4. Display state of the measured time after a click

If the user presses the mouse before the stimulus appears, they will be informed by the new state that they pressed too soon and the test will be repeated. (Fig. 5)

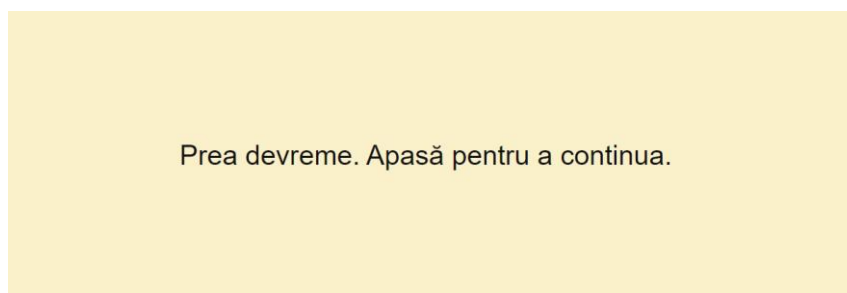


Fig. 5. Display state of the click press before the appearance of the visual stimulus

The reaction testing process will be performed three times. After the third attempt, the app will calculate the three response times and the web page will display the average of the measured times. This average represents the end result of the user. (Fig. 6)



Fig. 6. Display state of the average of the times measured after pressing the 3 clicks

3. Experimental results

Following the creation of the computer application, an experiment was carried out in which 20 people (10 male and 10 female) participated. Experimental results with reaction time to visual stimuli can be found in Table 1.

Table 1.

No. critical	Name	Age	Gender	Reaction time
1	Cătălin	16	Male	302
2	Andrei	18	Male	295
3	Dan	19	Male	291
4	George	20	Male	261
5	Ionuț	23	Male	277
6	Cristian	27	Male	285
7	Marius	29	Male	297
8	Mădălin	33	Male	310
9	Gabriel	42	Male	313
10	Tudor	54	Male	328
1	Andreea	16	Female	307
2	Ioana	18	Female	299

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3	Diana	20	Female	287
4	Valentina	21	Female	271
5	Mara	24	Female	280
6	Antonia	28	Female	281
7	Bianca	30	Female	300
8	Alexandra	32	Female	307
9	Miruna	45	Female	317
10	Maria	55	Female	330

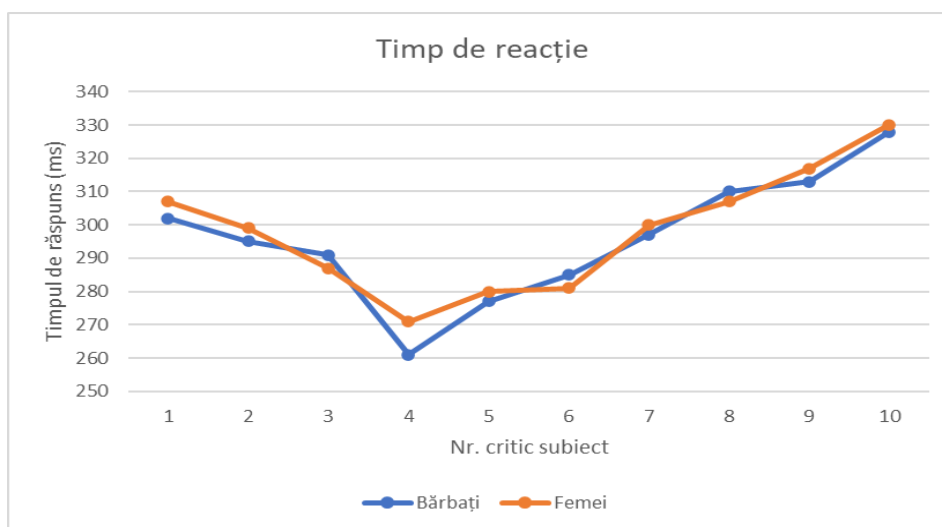


Fig. 7. Comparison of male (blue) and female (orange) response time results

From the analysis of the graph, it is observed that the reaction time of males is faster than that of females. Also, people in their 20s and 30s react faster than other individuals.

4. Conclusions

The experimental results obtained differ from person to person, highlighting the fact that the response time to visual stimuli differs according to the person's age, gender or physical condition, etc. The application can be used in the medical field to measure the response time of patients, and the data obtained can be saved in a database, to which the patient's doctors have access.

5. References

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