AoC-FRP Study

Dear interested participant,

we would like to invite you to participate in an experiment on the perception and understanding of code. The experiment includes several tasks on the computer, showing different snippets of code in the Java programming language, for which you are supposed to determine the result. Before the actual tasks start, you will have the opportunity to get to know the task in a practical exercise. The experiment will take about two hours, including preparation and follow-up. During this time, you will have the opportunity to take breaks. You will receive about 24€ for participating in the experiment (3€ per started quarter-hour).

It is important to us to point out that you are not obliged to participate in this study. If you decide to participate, you can also terminate your participation at any time and without giving reasons without any disadvantages for you - of course, you will be compensated for your participation until the time of termination.

Upon completion of testing, you may receive additional information regarding the purpose and outcome of the study if you wish.

If you have agreed to participate in this experiment, your electrical brain waves will be measured during the experiment: To do this, you will have an EEG cap placed on your head, to which electrodes will be attached. To accurately measure brain activity, a small amount of electrically conductive gel must be injected under each electrode so that it can record brain waves through the skin. To make sure that the signals can be conducted well, the skin is cleaned with cotton pads and alcohol to remove dead skin cells. All products are clinically tested. However, in very rare cases, sensitive skin may experience mild skin irritation after testing. Inform us if you suffer from hypersensitivity or allergies. Once all electrodes are properly attached, which usually takes about 45 minutes, you will be asked to complete the test tasks and move as little as possible while your brain waves are being recorded. After the experiment, the gel in your hair can be easily removed: wash basin, shampoo and hair dryer are available.

In addition, when reading the code sections, the direction of your eye gaze is recorded via infrared sensors in the eye tracker. This eye tracker only records the position on the screen that you are focusing on at the given time. Unlike a camera, the eye tracker cannot take pictures (e.g., of your face). For this, we also ask you to move as little as possible during the experiment. For a good acquisition quality, please clean your glasses beforehand, if you wear any, and remove any make-up around your eyes.

# Information on handling collected data

The data collected in this study will be anonymized, i.e., the recording and analysis of the data will be done using a subject number and no conclusions can be drawn from the subject number to your name.

Within the framework of the legal data protection regulations of the European Data Protection Regulation (GDPR), your data will be used exclusively for research purposes and stored for at least ten years. This also includes the publication of your data anonymized in this way as well as further use by third parties for research purposes, the exact purpose and scope of which cannot be foreseen currently.

Access to research data is granted to employees, interns of the Chair of Software Engineering at Saarland University and students assigned to the project for the periods described above and for exclusively scientific purposes. According to the GDPR, you have the right to request information about your personal data at any time and to request correction or deletion. Furthermore, you can revoke your consent at any time, provided that the storage of the data is not required for legal or contractual purposes (e.g., in the context of the declaration of consent).

# Information on handling personal data

Your personal data (first name and last name) will be processed in three documents as part of the experiment. Your first and last name will be collected for the purpose of your **consent to participate in** this study on the following consent form. This will be *kept for a period of at least 10 years (for the duration of the retention of the anonymized data).*

Your first and last name will continue to be kept in the form of a **receipt** until the time of accounting for the purpose of trial participant accounting and will be forwarded to the department of Saarland University responsible for accounting.

Your first and last name will continue to be kept in the form of a **list of participants in the study** until the *end of the overall project (maximum 10 years).* The list only assigns you to the study as such and not to your individual study record, for which the procedure already outlined above applies.

If you have any further questions about this study, please feel free to contact the experimental or project manager at any time (see also contact details below).

# Declaration of consent AoC-FRP Study

I have received the **information sheet on the AoC-FRP Study** about the procedures and tasks of this experiment and the voluntary nature of my participation, as well as the **information sheets about the handling of collected data**. I understand that I am participating in a research project in which I am completing tasks related to visual perception. I have been informed that the experiment will last no longer than a total of **3 hours** and **will be compensated at 12€ per hour.** I know that the information obtained through my participation in the study **will be used exclusively for scientific purposes**.

I have been informed that my participation in this study is completely **voluntary.** I can **cancel at any time without giving reasons and** without any disadvantages for me. I will be issued a pro-rata compensation for past participation. I know that I can ask questions at any time. If any **discomfort arises** during the study, I may discontinue and/or discuss my concerns with the experimental manager. I know that the experimental or project manager is available at any time to answer further questions about the study (please send questions to … ).

I have been informed that all information obtained through my participation in the study, including how I completed the tasks, will be **stored anonymously so** that no conclusions can be drawn about my person. I have been informed that my *anonymized data may be stored for at least ten years for research purposes*. This also includes the *publication of my data anonymized in this way as well as further use by third parties for research purposes, the exact purpose and scope of which cannot be foreseen at this point in time.*

I have been informed that my personal data in the form of **first and last name** *will be kept within* the scope of this **consent form for** *as long as the anonymized data are kept, but at least for a period of 10 years*. Furthermore, my **first and last name** will be kept on the **receipt for** purposes of accounting for trial subjects' fees until they are accounted for, at which time they will be *passed on to the department of Saarland University responsible for accounting*. In addition, my **first and last name** will be *kept in the* form of a **list of participants in the study** until the *end of the overall project or for a maximum of 10 years*. Access to all these described data will be granted to *employees, interns of the Department of Software Engineering at Saarland University* and *students assigned to the project in the context of their final thesis*. I have been informed about my rights in terms of the GDPR.

I have also been informed that I may receive additional information after the study if I wish. I also know that I must keep the information given to me about the course of the experiment confidential and not disclose it to potential subjects.

I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ consent to participate in the AoC-FRP Study conducted by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and by <author> and agree to the terms and conditions outlined in this statement.

(Name of the experimental manager)

(Name of the participant)

\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Place) (Date) (Signature of the participant)

I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hereby declare that I have informed the participant verbally and in writing about the nature, significance, scope and risks of the above-mentioned study and have provided him/her with a copy of the information sheet on the AoC-FRP Study, the information sheet on the handling of collected data and this consent form.

(Name of the experimental manager)

\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Place) (Date) (Signature of the experimental manager)

Start of the experiment: \_\_\_\_ : \_\_\_\_\_

End of the experiment: \_\_\_\_ : \_\_\_\_\_

# Handedness questionnaire according to Oldfield (1971)

**AoC-FRP Study - Subject number: E**

Please indicate which hand you prefer to use in the following activities by placing a cross in the appropriate column. Where the hand preference was so great that you would never have tried to use the other hand, please put 2 crosses. If you are unsure, make a cross in both columns. Please try to answer all questions. Only if you have no experience with the object or task, leave the column blank.

|  |  |  |
| --- | --- | --- |
| X | X : use both hands | X : use this hand | XX : always use this hand |

Which hand do you use when you ...

|  | Left hand | right hand |
| --- | --- | --- |
| 1. Write |  |  |
| 2. Draw |  |  |
| 3. Throw a ball |  |  |
| 4. Cut with scissors |  |  |
| 5. brush teeth |  |  |
| 6. Cut with a knife |  |  |
| 7. Eat with a spoon |  |  |
| 8. sweep with a broom (upper hand) |  |  |
| 9. Light a match |  |  |
| 10. Open a container (lid) |  |  |

Are you right-handed or left-handed?

| □ Right-handed | □ Retrained left-handed | □ Left-handed | □ No dominant hand |
| --- | --- | --- | --- |

Is there anyone in your family (mother, father, siblings) who prefers the left hand to the right?

□ yes □ no

# Pre-Questionnaire

**AoC-FRP Study - Subject number: E**

1. How old are you?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 18-20 |  | 31-35 |  | 46-50 |
|  | 21-25 |  | 36-40 |  | >50 |
|  | 26-30 |  | 41-45 |  | Not specified |

1. What gender are you? / What gender do you identify with?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Male |  | Female |  | Diverse |  | Not specified |

Which language do you speak? (Multiple selection possible)

|  |  |  |  |
| --- | --- | --- | --- |
| German | English | None | Others: ……… |

1. Do you have impaired eyesight?

|  |  |
| --- | --- |
|  | Yes, I wear glasses for 100% vision. |
|  | Yes, I wear contact lenses for 100% vision. |
|  | Yes, I wear glasses and with them I have less than 100% vision. |
|  | Yes, I wear contact lenses and with them I have less than 100% vision. |
|  | No, I’ve got 100% vision. |

1. Do you have previous experience with EEGs (e.g., previous participation in EEG studies)?

|  |  |
| --- | --- |
|  | No, I have no experience with EEGs |
|  | Yes, I have already used EEG...... times. |

1. What is currently your profession? (Multiple selection possible)

|  |  |
| --- | --- |
|  | Undergraduate student (bachelor) Course of Study: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Graduate student (master) Course of Study: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | University employee Position / Area: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. How long have you been programming?

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | < 1 year |  | 1-3 years |  | 3-5 years |  | 5-10 years |  | > 10 years |

1. How often do you program lately?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Every day (several times) |  | 3-5 times a week |  | 1-2 times a week |
|  | Several times a month |  | Several times a year |  | Rarely |
|  |  |  |  |  |  |

1. Which programming languages can you work with? (Multiple selection possible)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Java |  | C |  | Python |  | \_\_\_\_\_\_\_\_\_\_\_\_ |
|  | JavaScript |  | C++ |  | PHP |  | \_\_\_\_\_\_\_\_\_\_\_\_ |
|  | TypeScript |  | C# |  | Visual Basic |  | \_\_\_\_\_\_\_\_\_\_\_\_ |

1. Which programming languages have you used recently? (Multiple selection possible)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Java |  | C |  | Python |  | \_\_\_\_\_\_\_\_\_\_\_\_ |
|  | JavaScript |  | C++ |  | PHP |  | \_\_\_\_\_\_\_\_\_\_\_\_ |
|  | TypeScript |  | C# |  | Visual Basic |  | \_\_\_\_\_\_\_\_\_\_\_\_ |

1. What is your home country / nationality?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Oral query for medications, etc.

# Post-Questionnaire

**AoC-FRP Study - Subject number: E**

1. How did you find the study / study design in general?

|  |
| --- |
|  |

1. Do you have any suggestions or ideas for improvement for us?

|  |
| --- |
|  |

1. You are now presented with the displayed code snippets. Which of the excerpts did you find particularly easy/difficult? Why?

|  |  |
| --- | --- |
| Easy | Difficult |
|  |  |

1. What strategy did you use to comprehend / solve the code snippets?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Linearly from first to last line |  | With a general idea of the snippet, focusing on specific code parts |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  |

1. Did you detect any changes in yourself in the comprehension of the code snippets (e.g., across blocks)? If so, what did this change look like?

|  |  |  |
| --- | --- | --- |
|  | Yes |  |
|  | No |  |

1. Did you find it easier to solve the last code snippets compared to the first ones?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Yes |  | No |