Recruitment Letter

Hello,

My name is Parsa Pourali, a PhD student in the department of Electrical and Computer Engineering working under the supervision of Prof. Joanne M. Atlee, a professor in the Cheriton School of Computer Science at the University of Waterloo. I am writing to ask for your participation in conducting a study that aims at analysing the impacts of novel tool enhancements in alleviating the cognitive challenges on UML modellers when using modelling tools.

Participation in this study involves coming into the laboratory and performing a few software modelling tasks in two individual sessions. The tasks include developing and debugging class diagrams and state machines, such as setting the triggering events, guards and actions for transitions, or locating inconsistencies and errors in the model. You will be asked to perform the tasks and say your thoughts loud (think-aloud protocol) and your activities will be video-captured from the computer screen and your voice will be recorded. We will measure the time that it takes you to fulfill each task and gauge your success or failure on a task. However, this study is meant to help us gauge the effectiveness of current tooling techniques; it is not intended to test your individual performance in any way. Participation in this study would take approximately 60 to 90 minutes per session. In appreciation of your time commitment, you will receive an honorarium of $25 for each of the two sessions and will be given the chance to enter into a draw and win a prize of $200 gift card if you attend both of the sessions. Odds for the draw are equal for all the participants which is approximately 1 in 20. The study has been reviewed and received ethics clearance through the University of Waterloo Research Ethics Committee.

If you are interested in participating, please perform the recruitment screening procedure by filling the screening form at: **[SURVEY MONKEY LINK]**. It should take up to 15 minutes of your time. We will then take your information to see whether you fit the study, and will contact you by email to schedule your laboratory session. You can cancel your appointment by sending me an email at ppourali@uwaterloo.ca. Please note that, the honorarium amount stated above will be paid to you only if you pass the screening questions and attend to the study. All screening data will be stored securely, if you do not fit the study or decide not to participate your screening data will be deleted. We will also notify you by email.

Please note that, you will be completing the screening by an online survey operated by SurveyMonkey. When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk your responses may be intercepted by a third party (e.g., government agencies, hackers). SurveyMonkey temporarily collects your computer IP address to avoid duplicate responses in the dataset but will not collect information that could identify you personally.

Data may be deposited in an online public repository/database. Data will be de-identified (i.e. data such as names, student numbers, and certain identifying demographic information removed) prior to submission to the repository/database. This process is integral to the research process as it allows other researchers to verify results and avoid duplicating research

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact Parsa Pourali by email at ppourali@uwaterloo.ca.

Sincerely,
Parsa Pourali

Recruitment Screener

A research study on analysing the impacts of tool advances in alleviating the cognitive challenges on UML modellers when using modelling tools.

Hello,

This is a recruitment screener for a study on analysing the impacts of tool advances in alleviating the cognitive challenges on UML modellers when using modelling tools. It is important to note that you will not be evaluated in any way and it is the tool that is under scrutiny, not you. The activity takes place in the University of Waterloo, room DC2551B. Participation is on a paid basis.

Are you interested in participating?
- Yes.
- No. *(Will thank the person and end the recruitment)*

We have a few questions to ask you to see whether you fit the profile of the individuals we need for this study. After you answer the questions, we will take your information for review, and then we will contact you by email to let you know whether your background is a good fit, and to schedule your laboratory session.

A. Background and Demographic Information

Name: *Your name will not be associated with your data.*

Email:

1. Are you currently enrolled as a student at the University of Waterloo?

   ☐ Graduate   ☐ Undergraduate   ☐ No

2. Department/Major? --

3. Have you taken a software engineering course that includes UML modelling?   ☐ Yes   ☐ No

4. How would you rate your familiarity with UML?

☐ Unfamiliar

☐ Fairly Familiar (Novice)

☐ Familiar

☐ Very Familiar

☐ Strongly Familiar (Experienced)

5. How would you rate your familiarity with UML Class Diagrams?

☐ Unfamiliar

☐ Fairly Familiar (Novice)

☐ Familiar

☐ Very Familiar

☐ Strongly Familiar (Experienced)

6. How would you rate your familiarity with UML State Diagrams?

☐ Unfamiliar

☐ Fairly Familiar (Novice)

☐ Familiar

☐ Very Familiar

☐ Strongly Familiar (Experienced)

7. Do you have any experience with using modelling tools?

☐ Yes ☐ No

8. (If Yes on Q7, survey monkey will show this question) In total, for how long have you had the experience i.e. how old is your experience (in month) ------

9. (If Yes on Q7, survey monkey will show this question) How frequently did you use the tools?

☐ Several times a day

☐ 3-5 days a week

☐ 1-2 days a week

☐ Every few weeks

☐ Less often

10. (If Yes on Q7, survey monkey will show this question) Please list the name of the tools with which you have experience: -------------

11. (If Yes on Q7, survey monkey will show this question) How much of your experience with the modelling tools was in an industrial setting (in month)? ------

12. In this study, you will be asked to use one of the modelling tools of your choice. What modelling tool do you want us to prepare for you to use (e.g., MagicDraw, VisualParadigm, Papyrus, ArgoUML, etc.)? ----------------

B. Confidentiality Agreement, and Permission to Screen-capture and Audio-Record

We also have some questions to make sure you understand and are comfortable with our procedure before you come in:

1. Are you willing to sign a standard consent form, which acknowledges that you agree to participate? ☐ Yes ☐ No

2. Are you available to participate for two sessions during a two-week period? ☐ Yes ☐ No

3. Are you willing to have your voice recorded and your activities with the tool be screen-captured? (The purpose is that we can go back and capture more detailed notes. Recordings are seen internally only by members of the research team - mainly the research student.) ☐ Yes ☐ No

4. Every participant will receive an honorarium of 25.00 CAD per session (50 CAD for both of the sessions) and the chance to enter into a draw to win a prize of $200 gift card (if he/she attends both of the sessions). Are you willing to participate based on the honorarium? ☐ Yes ☐ No

C. Screening Exercise: UML Knowledge Assessment
We would like to ask you a few questions o assess if you are a good match with our study.

Question 1
What type of relationship is needed to represent the relationship between students and the courses they are enrolled in a university?
- A one-to-one association.
- A one-to-one composition.
- A one-to-many association.
- A one-to-many composition.
- A many-to-many association.
- A many-to-many composition
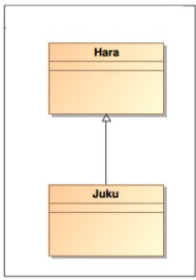
Question 2
Which of the following statements are true?
- The operation or attribute that are used in a state machine should not be defined in the class diagram.
- Every transition between any of the two states should have its triggering event or guard set.
- All the states in a state machine should have at least one incoming transition or outgoing transition.
- Operations should not have parameters and return values

Question 3:
You are given the following state machine diagram. Which of the following statements about allowable state order are true?
- money is an event;
- The transition from CardCheck to Order is a timed transition consisting of a time-based event and a guard.
- money is a state.
- When money occurs, the system will go to its Vending state.
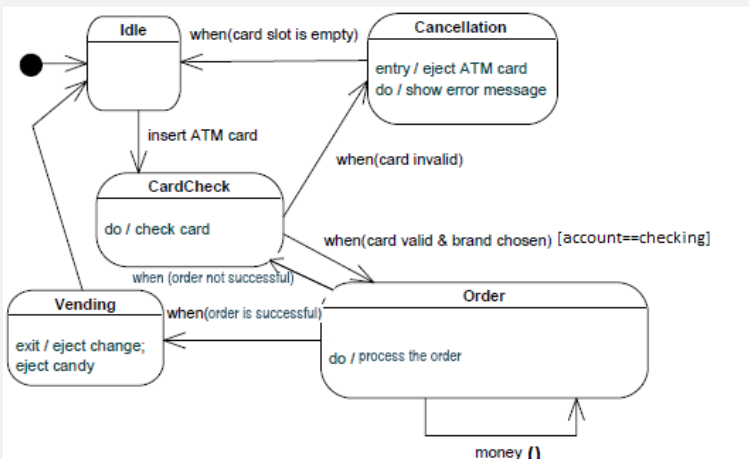
Question 4:
What does the syntax for labelling a transition look like?
- event [guard] / action
- [guard] action / event
- action [guard] / event
- [action] guard / event
- [action] event / guard

Question 5:
You want to model the following situation: A home delivery service has the two states Wait and Deliver. At the beginning, state Wait is active. As soon as a customer has ordered a product, a transition to state Deliver takes place. During the transition from state Wait to state Deliver, the order is processed. State Deliver stays active until the product has been delivered to the customer, triggering a transition to state Wait. Which transition expression would you select from the list below for the transition from state Wait to state Deliver?
- order received / process order
- / process order
- order received [process order]
- [order received] / order is processed
- [order] / process order

<div align="center">**Statement of Informed Consent**</div>

By signing this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

Title of the study: A research study on analysing the impacts of tool advances in alleviating the cognitive challenges on UML modellers when using modelling tools.

Purpose:
You have been asked to participate in a research study for analysing the impacts of tool advances in alleviating the cognitive challenges on UML modellers when using modelling tools. By participating in this activity, you will help us enhance modelling tools and improve their usability, usefulness, and quality. This activity is meant to help us gauge the effectiveness of current modelling tools; it is not intended to test your individual performance in any way.

Procedure:
You will be asked to perform a few modelling tasks related to editing and debugging UML class and state diagrams such as creating a transition expression in a state diagram, or locating errors in models. While you work, I will video-capture the computer screen, record your voice, and record some comments such as your time on tasks and task success or failure. It is expected that the study will take 60 to 90 minutes per session. In appreciation of your time commitment, you will receive an honorarium of 25CAD per session and will be given the chance to enter into a draw and win a prize of 200CAD gift card (if you attend both of the sessions). Odds for the draw are equal for all the participants which is approximately 1 in 20. The amount received is taxable. It is your responsibility to report this amount for income tax purposes.

Confidentiality:
We will use the data you give us, along with the information we collect from other participants, to analyze the effectiveness of our tool advances on modellers while performing modelling tasks. To ensure confidentiality, we will not associate your name with your data. The dataset without identifiers may be shared publicly. Your identity will be confidential.

Benefits:
Although the research may provide no direct personal benefit to you (as a participant), it will provide benefits to the academic community/society in a way that it will improve the quality of UML modelling tools and therefore alleviate the task of software modelling.

Risks:
Generally, there are no known or anticipated risks associated with participation in this study. However, we think that because of the nature of the think-aloud protocol, you might feel that you are under the scrutiny and may feel nervous about your performance. We would like to re-emphasize that you will not be evaluated in any ways. It is the tool that is under scrutiny, not you.

Breaks:
There will not be a scheduled break. However, you may take a break at any time.

Your Rights as a Participant:
Your participation in this study is voluntary. You also have the right of freedom to withdraw. You may withdraw from the activity at any time without penalty. You will still receive the $25 if you withdraw during the session. However, you will not be eligible to enter into the draw. Moreover, you can request your data to be removed from the study up until 2018/12/31 as it is not possible to withdraw your data once papers and publications have been submitted to publishers.

I have read the information presented in the information letter about a study being conducted by Parsa Pourali, a PhD student of the Department of Electrical and Computer Engineering at the University of Waterloo. I have had the opportunity to ask any questions related to this study, and to receive satisfactory answers to my questions and any additional details I wanted. I am aware that I may withdraw from the study without penalty at any time by advising the researchers of this decision. I understand my work during the study will be observed and Parsa Pourali will be measuring the time that it takes me to fulfil my tasks.

☐ I agree to my working computer screen being video captured for the purpose of analysing my performance with the tools.

☐ I agree to my voice being recorded for the purpose of analysing my performance with the tools.

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#23219). If you have questions for the Committee contact the Office of Research Ethics, at 1-519-888-4567 ext. 36005 or ore-ceo@uwaterloo.ca.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact Parsa Pourali by email at ppourali@uwaterloo.ca.

With full knowledge of all the foregoing, I agree, of my own free will, to participate in this study.
Print Name:
Signature of Participant: Date: