University of Arizona
Consent to Participate in Research

Study Title: High-level specification language for visualization of Control Flow Graphs

Principal Investigator: Sabin Devkota

Sponsor NSF

Summary of the research

This is a consent form for participation in a research project. Your participation in this research study is voluntary. It contains important information about this study and what to expect if you decide to participate. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

You are being asked to participate in a study to evaluate the high-level language designed by the research team from HDC lab, Department of Computer Science. The language is used to visualize control flow graphs (CFGs) which are commonly used to analyze computer programs. The study will involve an online survey, which will take approximately 20 mins where you will be asked to compare a pair of drawings to determine which of the two drawings better represents the graph and/or which one you prefer. You will be given a series of such comparison questions of the same format with different drawings. You will also be asked to identify program structures in the drawings if any. There is no direct benefit to you. This study will contribute to designing better visualization tools for control flow graphs which will in turn enable better ways to analyze computer programs. There are no foreseeable risks in participating in the survey. Our research also involves a user study in addition to the survey. Participation in the user study is voluntary as well and you can choose to participate in either or both of these research procedures. You will receive information about the user study separately.

Why is this study being done?

This research is performed to evaluate the effectiveness of a high-level language designed by the researchers from HDC lab, Department of Computer Science to visualize Control Flow Graphs (CFG). CFG is a common graph type used to analyze computer programs. The study aims to find out whether the language offers better visualization support compared to commonly used graph visualization systems such as graphviz/dot. The study will help develop better languages/tools for visualizing control flow graphs to produce drawings that are clutter free and match the mental model of programmers. Better visualization support will help with analyzing the computer programs to make them more efficient.

What will happen if I take part in this study?

If you decide to take part in the online survey, you will be shown a pair of graph drawings and asked to judge which of two drawings better represents the graph and/or which one you prefer. You will be given a series of such comparison questions of the same format with different drawings. You will also be asked to identify program structures in the graph drawings if present. Our research also involves a user study in addition to the survey. We will send you information about the user study separately. Participation in the user study is voluntary as well.

How long will I be in the study?
The expected duration of the study will be approximately 20 minutes.

How many people will take part in this study?
50

Can I stop being in the study?
Your participation is voluntary. You do not need to participate in this study. If you decide to take part in the study, you may leave the study at any time. You may choose to withdraw data collected during your participation or after regardless of whether you completed the study or not. Your response as well as identifying data will be immediately removed upon withdrawal as long as we have the identifying information. Note we remove identifying information for all participants when the results are analyzed. No matter what decision you make, there will be no penalty to you and you will not lose any of your usual benefits. Your decision will not affect your future relationship with The University of Arizona. If you are a student or employee at the University of Arizona, your decision will not affect your grades or employment status.

What risks or benefits can I expect from being in the study?
There are no foreseeable risks in participating in the study. You may not benefit from participation unless they are one of our research collaborators in which case they will be able to provide direct feedback on the tools we are designing and implementing for control flow graph visualization. The observations and findings of this user study will enable better visualization support for control flow graph which is a common type of graph used to analyze computer programs. This will benefit program developers with better languages and tools for graph visualization and program analysis. It will also benefit visualization researchers by documenting the evaluation of the specification language.

Will I be paid for participating in the study or experience any costs?
There will be no compensation for participating in the study. There will be a time cost of approximately 20 minutes.

Will my study-related information be kept confidential?
Your name will not be stored. Anonymized response data will be password protected. If you wish to provide your email address so that you can be updated about research results or you can withdraw at a later time, your response will be assigned a code number. The list connecting your email address to this code will be kept separate in an encrypted and password protected

file. Only the research team will have access to the file. When the study is completed and the data have been analyzed, the list will be destroyed.

The information that you provide in the study will be handled confidentially. However, there may be circumstances where this information must be released or shared as required by law. The University of Arizona Institutional Review Board; other federal, state, or international regulatory agencies; or the sponsor of the study, if any, may review the research records for monitoring purposes.

Will my study-related information be used for future research?

Information collected about you will not be used or shared for future research studies. Identifying data will be removed. Deidentified observation data will be presented in the resulting research publication.

Who can answer my questions about the study?

For questions, concerns, or complaints about the study you may contact **Sabin Devkota (devkotasabin@email.arizona.edu)**.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Human Subjects Protection Program Director at 520-626-8630 or online at http://rgw.arizona.edu/compliance/human-subjects-protection-program.

I have read the consent form, and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. By participating in the survey, I voluntarily agree to participate in this study.