SPECIFIC ETHICAL PROTOCOL

for Scientific Research at the Faculty of Engineering and Architecture of Ghent University

Version of 15 Aug, 2022

Ethical Committee, Faculty of Engineering and Architecture Sciences, Ghent University

REQUEST TO THE ETHICAL COMMITTEE FOR ADVICE CONCERNING THE FOLLOWING RESEARCH PROPOSAL:

1 TITLE OF THE RESEARCH PROJECT:

Software Protection Strength Evaluation

2 NAME OF THE RESEARCHER(S):

Tianyi (Tab) Zhang

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SUPERVISOR: prof. Bjorn De Sutter

DEPARTMENT: Department of Electronics and Information Systems

3 IS THERE A FINANCIAL SPONSOR FOR THIS PROJECT?

Yes, this research is funded by the FWO (grant G0E2318N) and by the Cybersecurity Initiative Flanders.

GHENT UNIVERSITY

4 IS THE PROJECT PART OF ANY COOPERATION BEYOND THE FACULTY? IF SO, SPECIFY THE INSTITUTIONS INVOLVED.

We work together with the University of Vienna, Faculty of Computer Science, Research Group Security and Privacy (head prof. Sebastian Schrittwieser) as part of the FWO lead agency project G0E2318N. We are also collaborating informally with with prof. Christian Collberg from The University of Arizona, Department of Computer Science.

5 BRIEFLY SUMMARIZE THE RESEARCH PROJECT (AT MOST 200 TO 400 WORDS, ALSO UNDERSTANDABLE TO PEOPLE THAT ARE NOT ACQUAINTED WITH THE SUBJECT). EMPHASIZE WHAT ACTUALLY WILL HAPPEN DURING THE RESEARCH, FROM RECRUITING TO REPORTING (NOT THE THEORETICAL BACKGROUND).

Researchers seek to understand better the process by which ethical hackers reverse engineer computer code that is protected by protection/obfuscation techniques. We also want to research potential metrics to evaluate the strength of software protections and to assess the validity of proposed metrics. To do that, participants are invited to reverse engineer a given program while using data collection software. Data collected by the software is then to be analyzed to answer the research questions.

Participants

All participants will be students taking the Software Hacking and Protection course at UGent.

They are required to perform reverse engineering tasks associated with this study during a lab session as a part of the course curriculum and will receive a grade for participating to that lab, similar to how they are graded for the other weekly labs in the course. However, they are free to choose whether they want to formally be a part of the study. Their participation to the study will be completely pseudonymous and their choice of participation will not be known by the instructors and TAs of that lab session.

Procedural details

- Participants will be handed a copy of the consent form and the information sheet at least a week before the study takes place, via Ufora, so that they have time to decide if they wish to participate.
- Before the start of the study (i.e., the start of the weekly lab), students that choose to formally participate to the study will sign the digital consent form on Qualtrics by clicking a consent button (without actually providing their name) and be randomly assigned a pseudonymous participant number (automatically generated by Qualtrics). The participant number associates their data with their demographic information, such that we can perform statistical analysis afterwards.
- Students that wish not to participate to the study, simply do not click the consent button.
- Participants will use the assigned participant number to fill out a questionnaire to provide demographic information including experience with binary reverse engineering and programming experience. They will need to set up a Virtual Machine of their choice (or use the one we provide) and install the data collection software we provide to them.
- Participants will then download the problem script and all relevant components, enable the data collection software, and begin solving the problem. Data, including screenshots of what they are doing, what they type, and any mouse movement, will be collected on the virtual machine while you solve the reverse engineering problem. But they can easily click a button to stop or resume the collection at any time.

- Once they complete solving the problem, they will submit the solution along with your participant number electronically and pseudonymously using a web form. They will also be asked to fill out a post-completion survey using their participant number to describe their reverse engineering approach and provide any comment and feedback.
- Those who satisfactorily complete the study will receive a €50 in gift card. They will claim it online pseudonymously using their participant number. Detailed procedures will be provided on Ufora.

6 DOES THE RESEARCH PROJECT IMPLY ANY THREATS TO THE PARTICIPANTS' HEALTH? HAVE YOU ALSO SUBMITTED A REQUEST TO THE MEDICAL ETHICAL COMMITTEE?

The studies do not imply any threats to the participants' health. Therefore, no request to the medical ethical committee has been submitted.

7 ARE THE PARTICIPANTS HAVING ANY DIFFICULTIES KNOWN BEFOREHAND? IF SO, SPECIFY WHETHER THE RESEARCH PROJECT COULD INTERFERE WITH THESE DIFFICULTIES AND WHAT PRECAUTIONS YOU WOULD TAKE.

Not applicable.

8 IF THE PARTICIPANTS ARE ADULTS INCOMPETENT TO GIVE THEIR CONSENT, WHOM WILL BE ASKED PERMISSION TO?

Not applicable.

9 IF THE PARTICIPANTS ARE MINORS, WHOM WILL BE ASKED PERMISSION TO? (ATTACH THE REQUEST FORM YOU WILL USE).

Not applicable.

10 WILL DECEPTION BE USED DURING THE RESEARCH PROJECT? IF SO, DESCRIBE AND MOTIVATE.

Participants will not be deceived in any way during the experiment.

11 IN WHICH WAY WILL THE PARTICIPANTS BE INFORMED OF THE RESULTS OF THE RESEARCH PROJECT? WILL THERE BE A DEBRIEFING?

After experiments are over and results are analysed, interested participants will also be able to find results, including the final paper. They may ask questions and discuss the results with us further. A debriefing is available upon request.

12 WILL STUDENTS BE CALLED IN TO ASSIST TO THE RECRUITMENT OF PARTICIPANTS, DATA COLLECTION OR DATA ANALYSIS?

Only UGent staff of our lab will assist with the data collection, and analysis will be performed on the pseudonymous data by UGent staff involved in the project and their external collaborators.

13 WHAT IS YOUR PLAN FOR DATA-MANAGEMENT, DURING AND AFTER THE PROJECT? PLEASE FOCUS ON ETHICALLY RELEVANT ASPECTS. HOW WILL YOU INFORM THE PARTICIPANTS ABOUT YOUR PLAN?

We will not collect any sensitive personal data and all of the data we collect will be pseudonymous. Data will initially be stored securely on the work computers of the main researchers and processed according to GDPR regulations. Participants will be informed about our data plan via the informed consent.

14 IN THE CURRENT STATE OF THE RESEARCH PROJECT, DO YOU EXPECT OTHER DIFFICULTIES CONCERNING THE GENERAL ETHICAL PRINCIPLES AS WRITTEN DOWN IN THE GENERAL ETHICAL PROTOCOL? IF SO, DESCRIBE HOW AND MOTIVATE WHY THE RESEARCH PROJECT SHOULD DO SO

Not applicable.

I DECLARE TO TAKE THE FULL RESPONSIBILITY OF THE PROJECT MENTIONED ABOVE AND CONFIRM THAT THE INFORMATION GIVEN IS CONSISTENT WITH THE FACTS AS KNOWN ON THIS VERY MOMENT. I ALSO DECLARE TO HAVE READ THE GENERAL ETHICAL PROTOCOL FOR SCIENTIFIC RESEARCH OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GHENT UNIVERSITY, AND TO SUBSCRIBE TO IT CONCERNING ANY ITEMS 6A TO 6H WHERE NO REMARKS HAVE BEEN MADE. SHOULD DURING THE COURSE OF THE RESEARCH PROJECT ETHICAL QUESTIONS ARISE THAT ARE NOT COVERED BY THIS REQUEST, I WILL CONTACT THE ETHICAL COMMITTEE ANEW.

THE RESEARCHER	THE SUPERVISOR (AGREEMENT)
DATE:	DATE:
NAME:	NAME:
SIGNATURE:	SIGNATURE: