**FACULTY
OF INFORMATION
TECHNOLOGY
CTU IN PRAGUE**

Supervisor's statement of a final thesis

Supervisor: doc. Ing. Filip Křikava, Ph.D.
Student: Bc. Petr Adámek
Thesis title: Using malware detection techniques for dependency detection
                           of R programs
Branch / specialization: Computer Security
Created on: 3 June 2024

Evaluation criteria

1. Fulfillment of the assignment

▸ [1] **assignment fulfilled**
  [2] assignment fulfilled with minor objections
  [3] assignment fulfilled with major objections
  [4] assignment not fulfilled

All of the tasks defined in the assignment were successfully implemented.

2. Main written part   95 / 100 (A)

The thesis is well written. While the style is informal, it reads well and makes it engaging despite occasionally diving deep into technical details. It is well structured and nicely guides the reader through the problem the thesis aims to solve. I appreciate that it focuses on the why rather than what.
It serves as a good overview of the landscape and documentation for the implementation.
It would be nice to do one more pass to fix some typos.

3. Non-written part, attachments   92 / 100 (A)

The thesis was rather implementation-heavy (way more than we thought initially), but Petr did an excellent job.
The code is well-structured and well-documented. This is important as our research group will further use and maintain the tool.
I wish there were at least some system tests, but it is not easy to test this.

4. Evaluation of results, publication outputs and awards   95 /100 (A)

The tools developed in this thesis will be used as the core component in the R4R (ERC POC grant) currently being worked on at the PRL-PRG research lab at FIT.
However, its use goes beyond that, and it could be deployed in CRAN for package checking.
As for publication, we need to conduct more experiments to fully understand the limitations, but I am confident that it will interest the R community.

5. Activity of the student

▸ [1] **excellent activity**
  [2] very good activity
  [3] average activity
  [4] weaker, but still sufficient activity
  [5] insufficient activity

Working with Petr was a pleasure. He likes to dive into details, and I enjoyed the endless discussion about all the possible corner cases he has identified.

6. Self-reliance of the student

▸ [1] **excellent self-reliance**
  [2] very good self-reliance
  [3] average self-reliance
  [4] weaker, but still sufficient self-reliance
  [5] insufficient self-reliance

Petr knows what he is doing; he has managed the project well, both the implementation and the written part.

The overall evaluation   96 /100 (A)

The work done in this thesis brings a new tool to the R community that tackles two important use cases. First, it allows one to do a dependency auditing of R packages, which might be used for additional checks in R package repositories such as CRAN. Second, it will enable one to create a reproducible environment.
While it focuses primarily on supporting the R programming language well, it works for other programs, providing a tool that turns an execution into a docker image.

Instructions

Fulfillment of the assignment

Assess whether the submitted FT defines the objectives sufficiently and in line with the assignment; whether the objectives are formulated correctly and fulfilled sufficiently. In the comment, specify the points of the assignment that have not been met, assess the severity, impact, and, if appropriate, also the cause of the deficiencies. If the assignment differs substantially from the standards for the FT or if the student has developed the FT beyond the assignment, describe the way it got reflected on the quality of the assignment's fulfilment and the way it affected your final evaluation.

Main written part

Evaluate whether the extent of the FT is adequate to its content and scope: are all the parts of the FT contentful and necessary? Next, consider whether the submitted FT is actually correct – are there factual errors or inaccuracies?

Evaluate the logical structure of the FT, the thematic flow between chapters and whether the text is comprehensible to the reader. Assess whether the formal notations in the FT are used correctly. Assess the typographic and language aspects of the FT, follow the Dean's Directive No. 52/2021, Art. 3.

Evaluate whether the relevant sources are properly used, quoted and cited. Verify that all quotes are properly distinguished from the results achieved in the FT, thus, that the citation ethics has not been violated and that the citations are complete and in accordance with citation practices and standards. Finally, evaluate whether the software and other copyrighted works have been used in accordance with their license terms.

Non-written part, attachments

Depending on the nature of the FT, comment on the non-written part of the thesis. For example: SW work – the overall quality of the program. Is the technology used (from the development to deployment) suitable and adequate? HW – functional sample. Evaluate the technology and tools used. Research and experimental work – repeatability of the experiment.

Evaluation of results, publication outputs and awards

Depending on the nature of the thesis, estimate whether the thesis results could be deployed in practice; alternatively, evaluate whether the results of the FT extend the already published/known results or whether they bring in completely new findings.

Activity of the student

From your experience with the course of the work on the thesis and its outcome, review the student's activity while working on the thesis, his/her punctuality when meeting the deadlines and whether he/she consulted you as he/she went along and also, whether he/she was well prepared for these consultations.

Self-reliance of the student

From your experience with the course of the work on the thesis and its outcome, assess the student's ability to develop independent creative work.

The overall evaluation

Summarize which of the aspects of the FT affected your grading process the most. The overall grade does not need to be an arithmetic mean (or other value) calculated from the evaluation in the previous criteria. Generally, a well-fulfilled assignment is assessed by grade A.