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Responsiveness in Static Analysis Tools

by
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Abstract. The Static Analysis plays a major role in Software Development to find bugs and any vulnerabilities in code. There are different Analysis tools available in market. However, it is found out in different surveys about why the tools are not efficient as expected by Software Developers.

Contents

1	Introduction	1
2	Background	3
3	Problem Statement	5
4	Objectives	7
5	Approaches	9
6	Evaluation Plan	11
7	Limitations	13
8	Preliminary Structure	15
9	Time Plan	17
	Bibliography	18

Introduction

The effectiveness of Software Development relies on bug free coding. In our day to day progress in coding leads to complexity of software which brings a broader scope for bugs and vulnerabilities that could be introduced easily. There are many Static Analysis tools available in market to address these primary issues. However in latest surveys by Maria et al. [CB16] and by Johnson et al. [JSMHB13] it is noticed that Software Developers are not quite happy with effectiveness and usability of Static Analysis tools. This brings the scope for improvement of Static Analysis tools and the paper by Nguyen Quang Do et al. [NQDB18] introduces how Gamifying the bug fixing process could enhance the usability of Static Analysis tool.

Static analysis tools suffer from well-documented usability issues [CB16, JSMHB13].

Problem Statement

Objectives

Static analysis tools suffer from well-documented usability issues [CB16, JSMHB13]. Some analysis tools can report results in milliseconds, while others can take up to hours or days. This discrepancy in waiting times can be confusing to code developers, and in some poorly implemented tools, can lead to them thinking that the tooling froze when it is simply computing results. In this thesis, you will research different user interface designs that allow code developers to navigate around this issue in a non-disruptive way. You will:

1. Research different techniques that tackle the issue of responsiveness in other domains of software engineering.
2. Adapt those techniques and design your own techniques for the domain of static analysis.
3. Design prototypes with a mocking tool [4] of those techniques to improve the usability of analysis tools - with respect to responsiveness- (e.g., FindBugs, Soot, Checkmarx, etc.).
4. Design user studies that evaluate the efficiency of those techniques, with professional code developers.
5. Run the user studies and report on their results.

5

Approaches

Evaluation Plan

7

Limitations

Preliminary Structure

1. Introduction
2. Outline
 - 2.1 Problem Description
 - 2.2 Objectives
3. Background
 - 3.1 Static Analysis
 - 3.2
 - 3.3
4. Approache
 - 4.1
 - 4.2
5. Limitations and Future Work
6. Conclusion

9

Time Plan

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