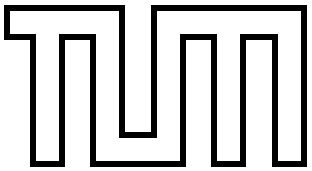

FAKULTÄT FÜR INFORMATIK

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Master's Thesis

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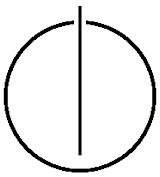
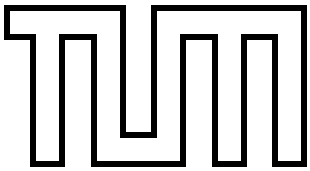
Md Adnan Rabbi





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Halbautomatische Erkennung von Sanitisierungs,Authenifizierungs und Deklassifierungsfehlern in UML-Zusantsdiagrammen.

Author:	Md Adnan Rabbi
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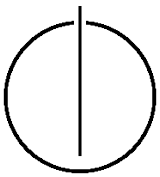
Date:	November 15, 2015



Ich versichere, dass ich diese Diplomarbeit selbständig verfasst und nur die angegebenen Quellen und Hilfsmittel verwendet habe.

München, den 13. August 2015 Md Adnan Rabbi

Acknowledgments

If someone contributed to the thesis... might be good to thank them here.

Abstract

An abstracts abstracts the thesis!

Contents

Outline of the Thesis

Part I: Introduction and Theory

CHAPTER 1: INTRODUCTION

This chapter presents an overview of the thesis and it purpose. Furthermore, it will discuss the sense of life in a very general approach.

CHAPTER 2: BACKGROUND INFORMATION

This chapter describes the background and the essential theory to establish the research.

Part II: Implementation and Analysis

CHAPTER 3: CHALLENGES AND LANGUAGE IMPLEMENTATION

This chapter presents the challenges and annotation language implementation for the system.

CHAPTER 4: IMPLEMENTATION

This chapter presents the implementation of the system.

CHAPTER 5: EXPERIMENTS

This chapter presents the different application area of the system.

Part III: Conclusion and Future Work

CHAPTER 6: CONCLUSION AND FUTURE WORK

This chapter presents the conclusion of the whole research along with future work intentions.

Part I.

Introduction and Theory

1. Introduction

The detection of information flow vulnerabilities uses dynamic analysis techniques , static analysis techniques and hybrid techniques which combine static and dynamic approaches. The static techniques need to know when to use sanitization , declassification and authentication functions. A solution for tagging sanitization, declassification and authentication in source code is based on libraries which contain all needed annotations attached to function declarations. This approach plays an important role mainly for static analysis bug detection techniques where the information available during program run-time is not available nor the interaction with the environment can be fully simulated. Extended Static Checking (ESC) is a promising research area which tries to cope with the shortage of not having the program run-time information. During extended static analysis additional information is provided to the static analysis process. This information can be used to define trust boundaries and tag variables. Textual annotations are usually manually added by the user in source code. At the same time annotations can be automatically generated and inserted into source code . ESC can be used to eliminate bugs in a late stage of the software project when code development is finished. Tagging and checking for information exposure bugs during the design phase would eliminate the potential of implementing software bugs which can only be removed very costly after wards. Thus security concerns should be enforced into source code right after the conceptual phase of the project. The paper presents five challenges concerning ESC. The last challenge reports of the annotation as being a very time consuming burden and is therefore disliked by some programming teams. The authors argue about the fact that annotations can cover design decisions and enhance the quality of source code. We argue that annotations are necessary in order to do ESC and the user needs a kind of assistance tool that helps selecting the suited annotation based on the current context. Thus the annotation burden needed for learning and applying the language should be reduced. At the same time adding annotations to reusable code libraries reduces even more the annotation burden since libraries can be reused, shared and changed by software development teams.

1.1. Latex Introduction

There is no need for a latex introduction since there is plenty of literature out there.

2. Background Information

2.1. Sanitization

Sanitization is the process of removing sensitive information from a document or other message or sometimes encrypting messages, so that the document may be distributed to a broader audience.Sometimes sanitization can be called as an operation that ensures that user input can be safely used in an SQL query. Some basic purpose of sanitization are given below:

- To identify the set of parameters and global variables which must be sanitized before calling functions.
- It is acceptable to first pass the untrusted user input through a trusted sanitization function.
- Any user input data must flow through a sanitization function before it flows into a SQL query.
- Confidential data needs to be cleansed to avoid information leaks.
- Most paths that go from a source to a sink pass through a sanitizer.
- Developers typically define a small number of sanitization functions or use ones supplied in libraries.

2.2. Declassification

Information security has a challenge to address: enabling information flow controls with expressive information release (or declassification) policies. In a scenario of systems that operate on data with different sensitivity levels, the goal is to provide security assurance via restricting the information flow within the system.
To declassify information means lowering the security classification of selected information. Sabelfeld and Sands [1] identify four different dimensions of declassification, what is declassified, who is able to declassify, where the declassification occurs and when the declassification takes place.

Part II.

The Second Part

Appendix

A. Detailed Descriptions

Here come the details that are not supposed to be in the regular text.

Bibliography

[1] Andrei Sabelfeld and David Sands. Declassification: Dimensions and principles. *Journal of Computer Security*, 17(5):517–548, 2009.