DHBW
Duale Hochschule
Baden-Württemberg

Implementing a graph-based clause-selection strategy for Automatic Theorem Proving in Python

from the course of studies Computer Science

at the Cooperative State University Baden-Württemberg Stuttgart

by

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Declaration of Authorship

Gemäß Ziffer 1.1.13 der Anlage 1 zu §§ 3, 4 und 5 der Studien- und Prüfungsordnung für die Bachelorstudiengänge im Studienbereich Technik der Dualen Hochschule Baden- Württemberg vom 29.09.2017. Ich versichere hiermit, dass ich meine Arbeit mit dem Thema:

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selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe. Ich versichere zudem, dass alle eingereichten Fassungen übereinstimmen.

Stuttgart, 03/04/2025

Jannis Gehring

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List of Acronyms

FOL	First order Logic
HTTP	Hypertext Transfer Protocol
REST	Representational State Transfer

Glossary

Exploit An exploit is a method or piece of code that takes advantage of vulnerabilities in software, applications, networks, operating systems, or hardware, typically for malicious purposes.

Patch A patch is data that is intended to be used to modify an existing software resource such as a program or a file, often to fix bugs and security vulnerabilities.

Vulnerability A Vulnerability is a flaw in a computer system that weakens the overall security of the system.

1 Introduction

2 Theory

2.1 First order Logic (FOL)

This chapter contains the underlying first-order predicate logic definitions and a short introduction to binary resolution. We start from the basic context of predicate logic.

A *term* constitutes an element of the corresponding domain and consists of *variables*, *functions* and *constants*.
Variables are denoted with the letters $\boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z}, \boldsymbol{x_1}, \boldsymbol{y_2}, \ldots$.
Functions Constants

2.2 Current clause selection strategies

References