



DEPARTMENT OF INFORMATICS

TECHNISCHE UNIVERSITÄT MÜNCHEN

Master's Thesis in Informatics

# **Formal Verification of an Earley Parser**

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## **Formale Verifikation eines Earley Parsers**

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I confirm that this master's thesis in informatics is my own work and I have documented all sources and material used.

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Martin Rau

## Acknowledgments

TODO: Acknowledgments

# Abstract

TODO: Abstract

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# 1 Introduction

$$\llbracket P; Q \rrbracket \implies P \wedge Q$$

**datatype** *'a cfg* = CFG (*'a list*) (*'a list*) ((*'a* × *'a list*) *list*) *'a*

## 1.1 Motivation

some introduction about parsing, formal development of correct algorithms: an example based on earley's recogniser, the benefits of formal methods, LocalLexing and the Bachelor thesis.

## 1.2 Structure

standard blabla

## 1.3 Related Work

see folder and bibliography

## 1.4 Contributions

what did I do, what is new

## 1.5 Isabelle/HOL

take closest pair paper section and add additional notation as needed

## 2 Earley's Algorithm

illustrate with derivation rules and text, first only the recogniser then the parser



## 3 Fixpoint Recogniser

## 4 Earley Recogniser

## 5 Earley Parser

## 6 Examples

## **7 Conclusion**

### **7.1 Summary**

### **7.2 Future Work**

# 8 Templates

## 8.1 Section

Citation test [**latex**].

### 8.1.1 Subsection

See [Table 8.1](#), [Figure 8.1](#), [Figure 8.2](#), [Figure 8.3](#).

Table 8.1: An example for a simple table.

A	B	C	D
1	2	1	2
2	3	2	3

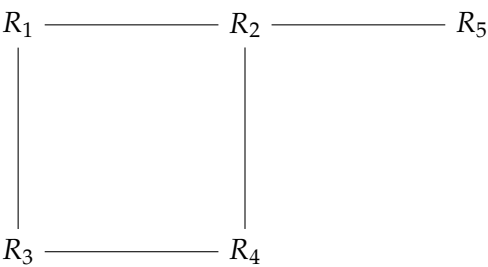


Figure 8.1: An example for a simple drawing.

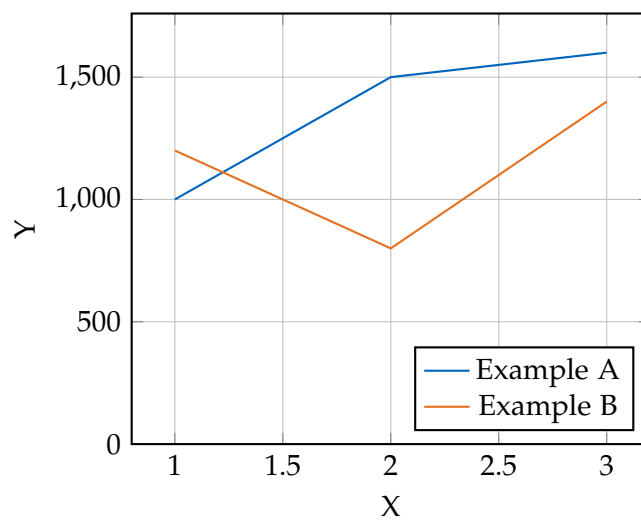


Figure 8.2: An example for a simple plot.

```
SELECT * FROM tbl WHERE tbl.str = "str"
```

Figure 8.3: An example for a source code listing.

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