

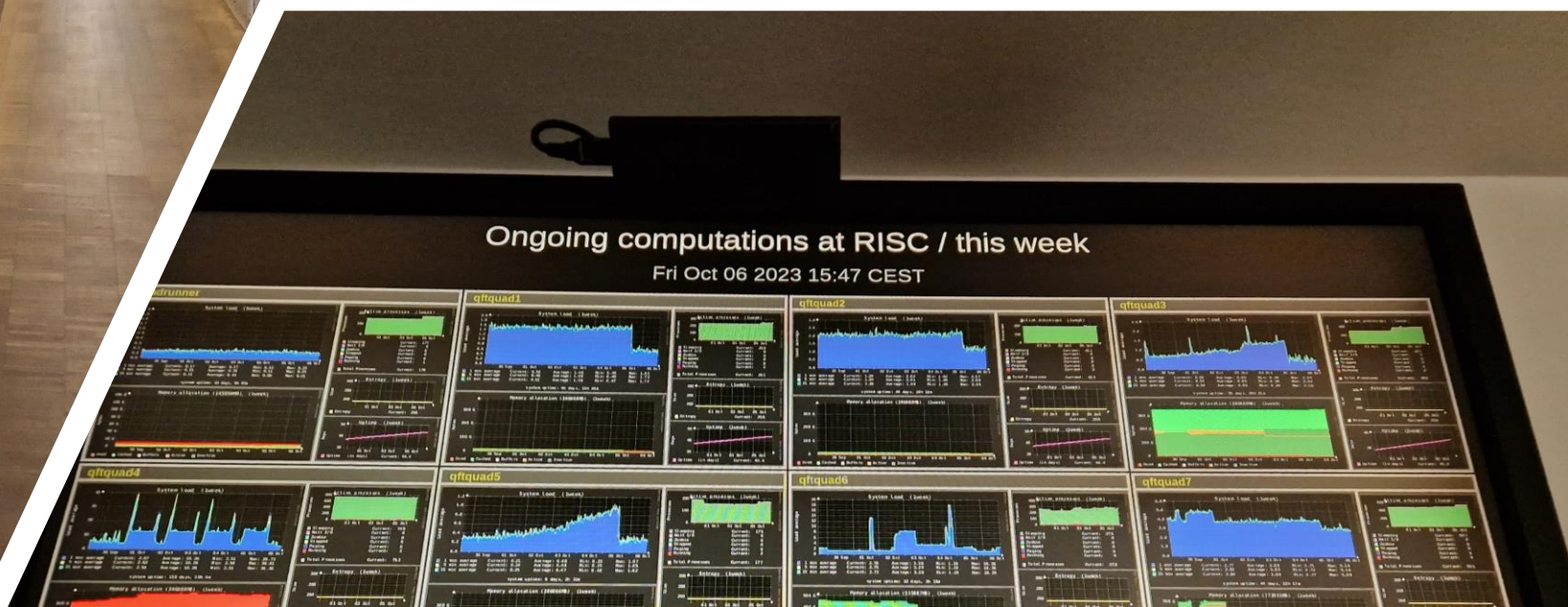
Wolfram Language & Mathematica

Funktionale Programmierung
und Software Engineering mit
Wolfram Language: Arbeit am
Theorema Package für
Mathematica

Jack Heseltine, BAS5/Hagenberg am 3.11.2023





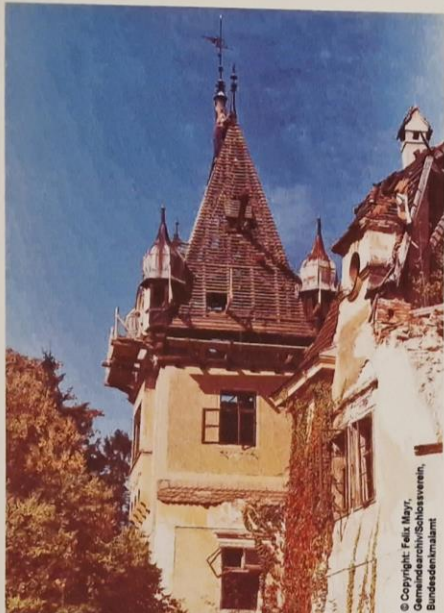


Schloss Hagenberg - der Beginn einer neuen Ära Castle of



1978: The former mayor of Hagenberg, Dominik Jogna, decides against the break-off of the ruin of Hagenberg.

1979: The Federal Office for historical monuments places the Castle of Hagenberg, which was a ruin at this time, under preservation order.



1983: Beschluss der Gemeindevertretung unter Herrn Bürgermeister Rudolf Fischerlehner, den Schlossturm neu eindecken zu lassen (auf Gemeindekosten).

1985: Die Gemeinde Hagenberg pachtet das Schloss und den Schlosspark auf 99 Jahre.

1983: The municipal council with mayor Rudolf Fischerlehner decides to reconstruct the roof of the castle tower.

1985: The community of Hagenberg rents the Castle of Hagenberg including the park around the castle from its owners for 99 years.



1986: Erste Absicherungs- und Aufräumarbeiten werden unter großer Mithilfe der Bevölkerung durchgeführt.

1986: With big help of the population of Hagenberg the clean-up of the ruin starts.

Das Schloss wird bis 1989 aufgebaut, RISC zieht ein. Buchberger beginnt sofort mit dem Aufbau des Softwareparks Hagenbergs.

The castle is rebuilt until 1989, RISC moves in the castle and Buchberger starts immediately to set-up the Softwarepark Hagenberg.

Doctoral Studies in Symbolic Computation

1987: Prof. Bruno Buchberger (Johannes Kepler Universität) entscheidet sich, mit seinem Forschungsinstitut RISC (Research Institute for Symbolic Computation) nach Hagenberg zu ziehen und erhält von Landeshauptmann Dr. Josef Ratzböck die Zusage der Mittelfürderung der Renovierung des Schlosses.

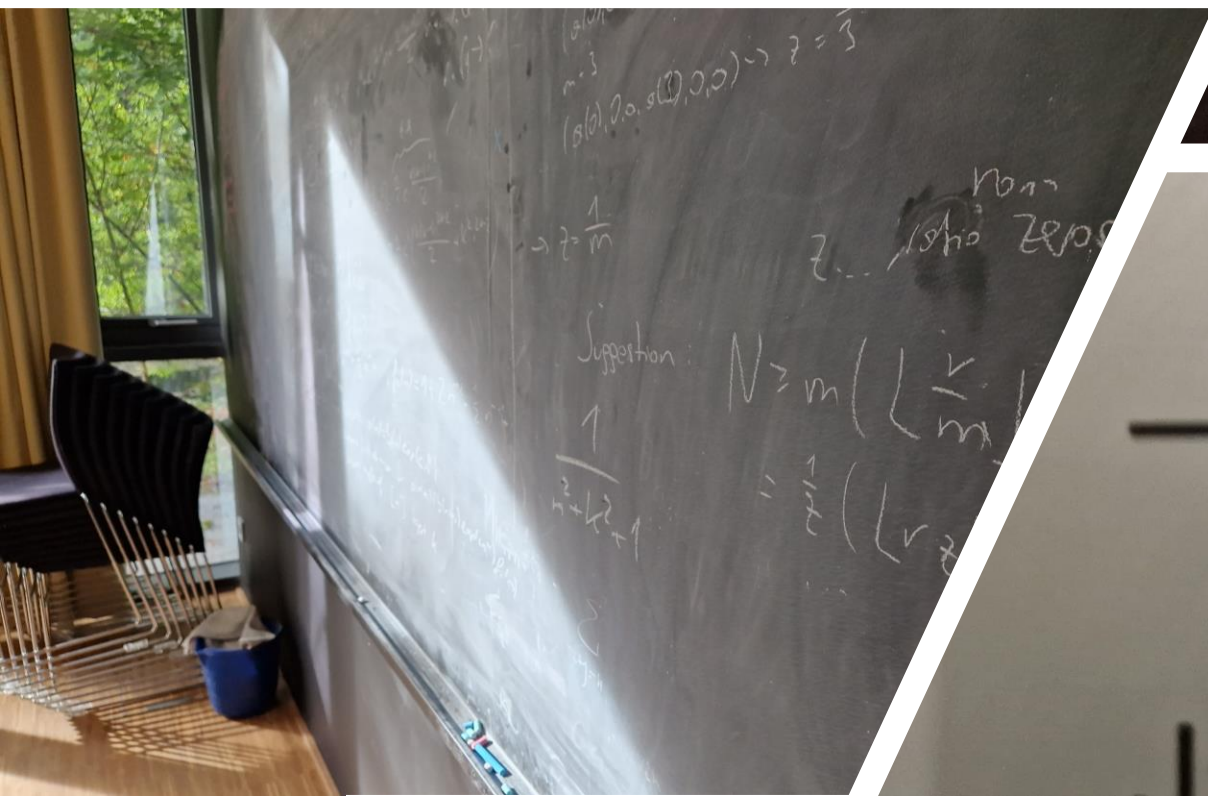


...ent and highly motivated students with a university degree in mathematics...
...ce in symbolic computation is an advantage but no formal requirement.
...continuously considered. Ideally, a RISC Ph.D study begins in the fall or in March '11).
...ould be sent timely (several months in advance).

Doctoral Studies



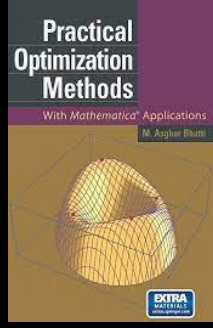
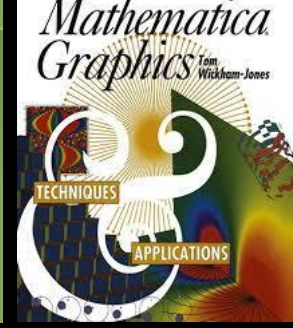
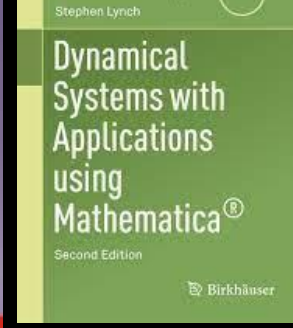
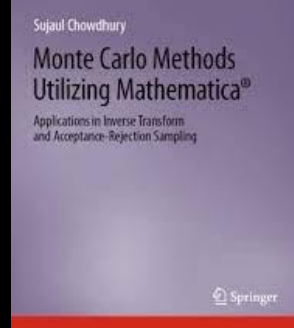
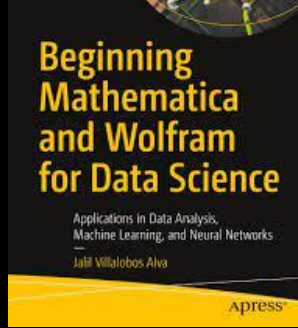
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Jack HESELTINE
Philipp NUSPL



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Jack HESELTINE

Fahrplan

- *RISC Intro mit Fotos (erledigt)*
- Mathematica Demo (1) + **Manual**
- Verbindung Mathematica-RISC: Theorema Project und Bachelorarbeitsthema
- Demo 2: Wolfram Workbench/Dokumenttransformation
- *bei Zeit: Wolfram Language als Multiparadigma-Programmiersprache*



Mathematica

- “A modern computational software system based on symbolic mathematics and used for various disciplines in science and engineering”
- **Demo-Notebook (Demo 1)**
- siehe auch:
<https://reference.wolfram.com/language/guide/LanguageOverview.html>

Wolfram Language & System
Documentation Center

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GUIDE

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Language Overview

The Wolfram Language is a highly developed knowledge-based language that unifies a broad range of programming paradigms and uses its unique concept of symbolic programming to add a new level of flexibility to the very concept of programming.

Mathematica
– Risc (mind.
seit 1996)

MATHEMATICA AS A REWRITE LANGUAGE *

BRUNO BUCHBERGER

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ABSTRACT

The kernel of the Mathematica language is a higher-order conditional rewrite language with sequence variables. This fact is little known. We derive some conclusions from this for the use of Mathematica as a research tool in the area of rewriting and related areas.

Theorema

Theorema

- Von RISC Webseite (Zugriff 29.10.2023)
- <https://github.com/windsteiger/Theorema>

A Mathematical Assistant System implemented in Mathematica

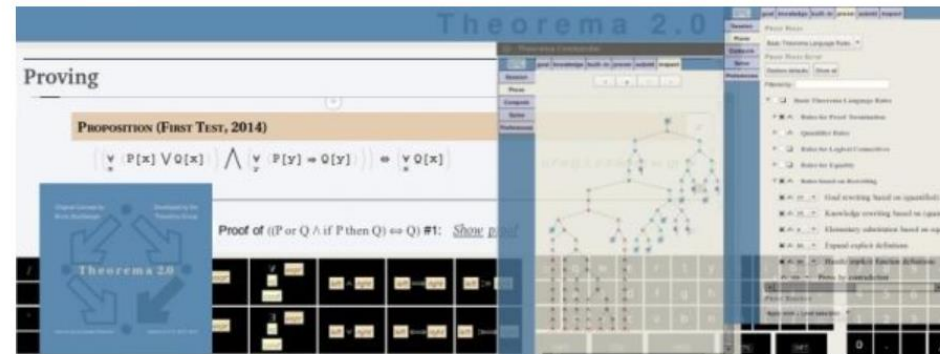
Automated Reasoning

Authors

[Alexander Maletzky](#), [Bruno Buchberger](#), [Markus Rosenkranz](#), [Nikolaj Popov](#), [Teimuraz Kutsia](#), [Tudor Jebelean](#), [Wolfgang Windsteiger](#)

Software URL

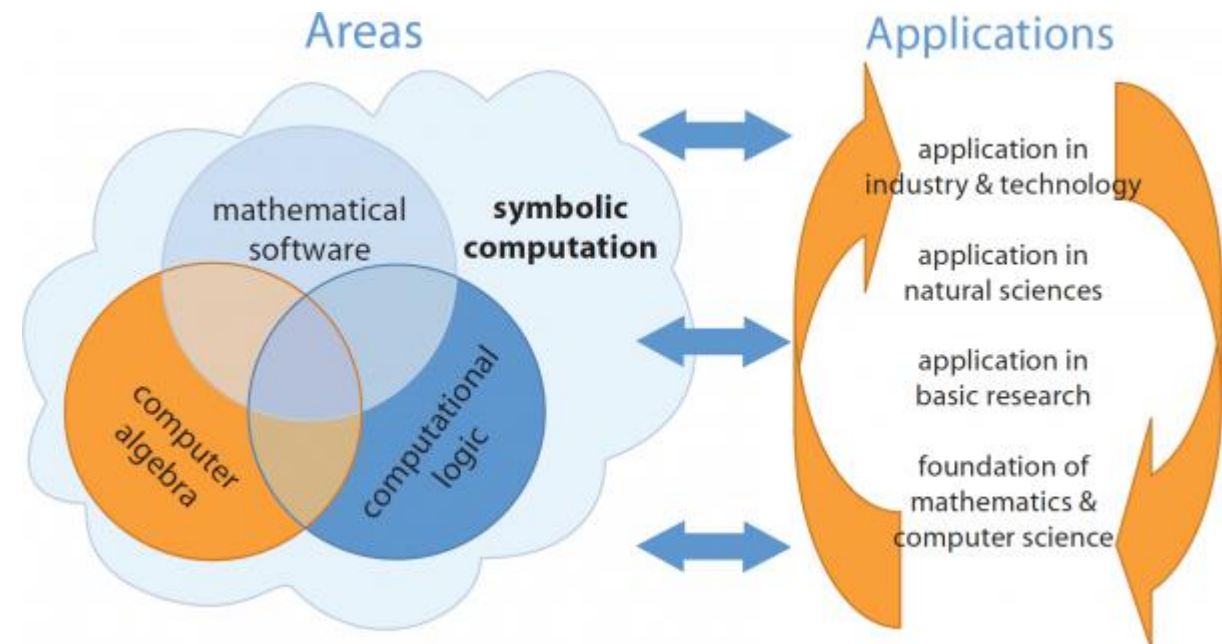
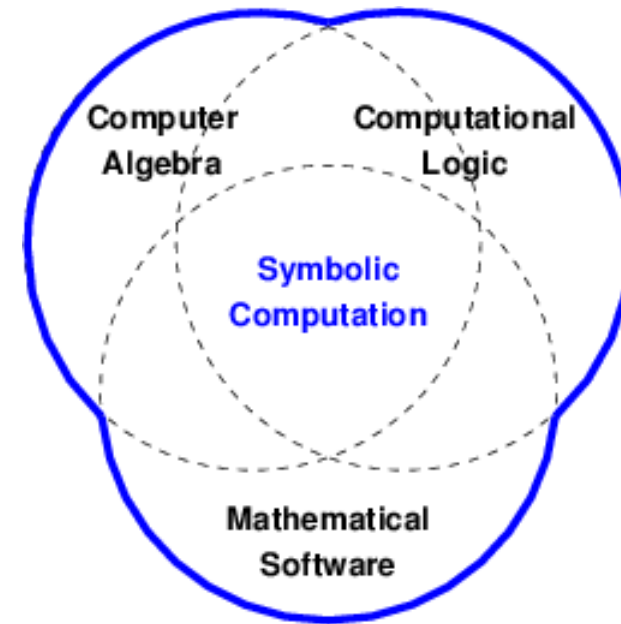
[Go to Website](#)



The *Theorema* project aims at extending current computer algebra systems by facilities for supporting mathematical proving. The present prototype version of the *Theorema* software system is implemented in *Mathematica*. The system consists of a general higher-order predicate logic prover and a collection of special provers that call each other depending on the particular proof situations. The individual provers imitate the proof style of human

Symbolic Computation

- Von RISC Webseite (Zugriff 29.10.2023)



Thema der Bachelorarbeit

- Von RISC Webseite
(Zugriff 29.10.2023)

Theorema Project: Document Processing

Theorema Project: Document Processing (Advisor: Wolfgang Windsteiger). The task in this thesis is to setup an environment for preparing entire (big) mathematical documents in Theorema 2.0. This comprises the design of appropriate Mathematica stylesheets and [a mechanism for translating Mathematica notebooks into nicely formatted LaTeX documents](#)

Prerequisites: basic knowledge of the Mathematica programming language and LaTeX, interest in writing/formatting mathematical documents, working in a bigger team, and structured software development.

Working area: 50% mathematics, 50% informatics.

Software Engineering mit Wolfram Lang.?

- ▼ Divide the System into Components
- ▼ Think of the Architecture, Not the Code
- ▼ Use Wolfram Language Code Packaging
- ▼ Keep Things Simple
- ▼ Use Source Control
- ▼ Write Documentation
- ▼ Write and Use Unit Tests
- ▼ Use Wolfram Workbench
- ▼ Take Advantage of the Wolfram Language
- ▼ Think of Other Developers
- ▼ Upgrading Your System
- ▼ Summary

- <https://reference.wolfram.com/language/tutorial/BuildingLargeSoftwareSystemsInTheWolframLanguage.html>
- **Demo 2: Wolfram Workbench**

Building Large Software Systems in *Mathematica*[®]



Building large software systems in *Mathematica* should follow the general principles that apply to building any large software system. The details may be unique to *Mathematica* but many of the principles are quite general. In

Bei Zeit:

Multiparadigma-Ansatz

s. Exposé Wissenschaftliches Arbeiten:

- Functional Programming + Lists and Replacements
 - Rule-based Programming
 - Recursion
- 