**Artem**

Comparison of Theorem Provers

**INTRODUCTION**

***Capture audience’s attention:***

*Why is your topic relevant or important for the audience? What is the industry current situation? What problems have resulted from their current practices?*

The need for formal definition of the very basis of mathematics arose in the last century.

The scale and complexity of mathematics, along with discovered paradoxes, revealed the danger of accumulating errors across theories.

theory of automated theorem proving as a practical area of logic. This is a set of techniques used to verify mathematical statements mechanically using logical reasoning. Moreover, it can be used to solve complex engineering problems as well, for instance, to prove the security properties of a software system or an algorithm. In this we compare two widespread tools for automated theorem proving, Isabelle/HOL and Coq, with respect to the power of expressiveness and usability.

There already are several works aim to compare main features of theorem provers [Related work], but in this paper we pursued the aim to give more deep comparison of two mostly widespread theorem provers, Coq and Isabelle.

***Establish credibility:***

*Who am I? Who is your tutor?*

I am Artem, my tutor is Stavros :|

***Purpose:***

*What solution are you presenting that will help the science or industry to overcome/avoid their problem?*

Problem: hard math theories, numerous of tools, very deep-level documentation => lack of information from usability point of view.

Solution: take two most widespread, compare them and describe feelings.

***Overview:***

*How have you divided up your talk? Briefly list your main topic areas: 1, 2, 3*

~~Main topic areas: 1. automated proof mgmt systems, 2. Logics (with calculi and type theories), 3. properties of logic systems.~~

Firstly, we’ll talk a bit about the theory, give the strict definition of the logical system

*(****Transition phrase****: previewing your first main point)*

In order to understand key differences btw considering proof systems, we need to learn basics of underlying theories – they differ.

**BODY**

1. **Foundation of formal approach**
   1. Definition of formal system
      * + little notation, axioms and inference rules, etc
        + properties, esp. completeness (needed for Coq)
   2. classical & intuitionistic logics
      * + classical
        + intuitionistic
        + connection btw them

*(****Transition phrase:*** *Restate-forecast)*

Curry-Howard correspondence, connection to proofs

1. **Comparison itself**
   1. bird-eye view
      * + Isabelle
        + Coq
        + diff..
        + ..erences
        + with
        + illustrative
        + examples

*(****Transition phrase****: Restate-forecast)*

<nope, only two areas>

1. **//THIRD TOPIC AREA**
   1. //Sub-topic one
   2. //Sub-topic two

*(****Transition phrase****: signal move to the conclusion)*

To summarise results, ...

**CONCLUSION**

**Summarize the main points:**

What has the audience learned today about each of your topic areas?

How hard the theorem proving is :/

**Estimate feasibility:**

Is the solution feasible in the near future?

Continue exploring :/

**Return to the problem or need:**

How will the listeners’ world be changed by your innovation?

They would never ever work with thm provers :/

**Encourage questions:**

Show that you are interested in hearing your listeners’ questions

If you are interested in this topic, please don’t leave so soon :/