



**FACULTY  
OF MATHEMATICS  
AND PHYSICS**  
Charles University

**MASTER THESIS**

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# **Improving Type Inference in the C# Language**

Department of Distributed and Dependable Systems

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Study programme: Computer Science

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In ..... date .....  
Author's signature

TODO: Dedication.

Title: Improving Type Inference in the C# Language

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Abstract:

TODO: Abstract.

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# Introduction

TODO: Describe what is type inference.

TODO: Describe type inference in *C#*.

TODO: Compare it with type inference in Rust or Haskell as an example of Hindel-Millner type inference.

TODO: Describe Roslyn.

TODO: Mention CSharplang repo, community, and describe a process of accepting lang changes.

TODO: Give an overview of chapters.

# 1. Related work

TODO: Describe type inference in C#.

TODO: Describe Hindel-Millner type inference.

TODO: Describe type inference in Rust or Haskell (Mention related papers about type inference).

TODO: Describe Roslyn(Focused on the part where the type inference is done).

TODO: Mention related Github issues and csharp-lang repo.

## 2. Problem analysis

TODO: Describe outputs of this work(Proposal and prototype). Why these outputs are necessary.

TODO: Describe the set of related issues.

TODO: Describe the selection and scope of this work based on the issues and other factors.

TODO: Describe problems of C# lang architecture which prohibits some advanced aspects of type inference.

TODO: Describe goals of the work and explain benefits of proposed changes.



# 3. Solution

TODO: Describe process of making proposal and the prototype.

TODO: Describe partial method type inference.

TODO: Describe constructor type inference.

TODO: Describe generic adjusted algorithm for type inference.

TODO: Describe decisions of proposed change design.

TODO: Describe changed parts of *C#* standard.

## 4. Evaluation

TODO: Describe achieved type inference. Mention interesting capabilities.

TODO: Note about the performance.

TODO: Links to csharp-lang discussions.

## 5. Future improvements

TODO: Mention next steps which can be done.

TODO: Discuss which steps would not be the right way(used observed difficulties).

# Conclusion

TODO: Describe issue selection.

TODO: Describe proposed changes in the lang.

TODO: Describe the prototype and proposal.

TODO: Mention csharp-lang discussions.

TODO: Mention observed future improvements.

# Bibliography

# List of Figures

# List of Tables

# List of Abbreviations



## A. Attachments