

Elementary Type Inference (Artifact)

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Abstract

This artifact contains the Appendix of the paper, proofs of theorems declared in the paper, and a sample implementation of the type inference algorithm. The proof contains 3 main results: soundness, completeness and decidability of the type-

inference algorithm. Moreover, there are several proofs about the declarative system and also a soundness/completeness proof between stable subtyping and a syntax-directed specification.

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Evaluation Policy The artifact has been evaluated as described in the ECOOP 2022 Call for Artifacts and the ACM Artifact Review and Badging Policy.

1 Scope

The paper has claimed that we formalized the correctness of a type inference algorithm for a variant of Fsub (without bounded quantification). The 3 main results are: soundness, completeness and decidability of the type-inference algorithm. Moreover, there are several proofs about the declarative system and also a soundness/completeness proof between stable subtyping and a syntax-directed specification. In the appendix of the submission, there is a table that describes the correspondence between notations in the paper and the corresponding files and names used in the Abella formalization. We also describe the correspondence between key lemmas in Abella and the paper below.

In addition, this Abella proof artifact is also reusable: any extension or alteration to the system can be easily done with our provided Abella scripts, and after possible adjustments, all the proofs can be reused for the formalization of the extended or altered system.

We also provide a sample implementation of the type inference algorithm in Haskell as well as some examples.

2 Content

The artifact package includes:

- The Appendix of the paper.
- Source code of the proof (Abella 2.0.8 dev).
- A modded version of Abella and proof scripts that relies on this version.
- A sample implementation and examples of the type inference algorithm.



5:2 Elementary Type Inference (Artifact)

3 Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS).

4 Tested platforms

The proof and Haskell implementation are tested on Ubuntu 20.04 with 2G memory and 1 CPU core. WSL 2 is also supported with similar hardware requirements.

5 License

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6 MD5 sum of the artifact

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7 Size of the artifact

5.73 MB