

Translating L_{if} to L_{cfi} : A Multi-Step Compilation Approach (Team 2)

Ephraim Siegfried, Luca Gloor and Ruben Hutter

University of Basel

Interpretation and Compilation of Programming Languages (ICPL) seminar
Autumn Semester 2024

1 Introduction

"Every program is open source if you know Assembly." - Unknown. But must this always be the case? What if we could write programs in a high level programming language like python and interleave them with many different programs without changing input-output behavior making it (almost) impossible to reverse engineer the original program? The interleaving part of this problem has already been solved by Ali Ajorian (TODO Luca: Insert Aporia Paper reference here) but the first part was where this project came into play. The goal was to create a compiler from the python subset L_{if} to the aporia language L_{cfi} allowing the original program to be obfuscated at a later point in time. This objective was achieved by generating two new intermediary languages L_{if}^{sc} and L_{if}^{flat} , each with their own restrictions and compiling the input program in three separate steps in order to finally reach the desired L_{cfi} representation.

In the following report, we will give an overview of the technical background before we explain the implementation of the project. We will also discuss the difficulties that were encountered while coming up with solutions, evaluate the achieved outcomes, and reflect on the lessons learned during the course of this project.

2 Technical Background

Write some technical background about Aporia and the idea behind it.

3 Implementation

How we implemented the compiler, what we used, how we structured the code, etc.

4 Difficulties

Write some difficulties you encountered during the project. This can be technical difficulties, difficulties with the group, etc.

5 Evaluation

In this section, we will evaluate the project and the results. We will discuss the project's objectives, the implementation, and the results. We will also discuss the project's limitations and possible improvements.

6 Lessons Learned

What we learned from this project...

7 Conclusion

A nice conclusion...

8 Individual Contributions

8.1 Ephraim

- **Technical Background:** Wrote the section about the technical background of the project.
- **Introduction:** Wrote the section about the introduction of the project.
- **Lessons Learned:** Wrote the section about the lessons learned from the project.
- **Conclusion:** Wrote the section about the conclusion of the project.

8.2 Luca

- **Introduction:** Wrote the section about the introduction of the project.
- **Technical Background:** Wrote the section about the technical background of the project.
- **Lessons Learned:** Wrote the section about the lessons learned from the project.
- **Conclusion:** Wrote the section about the conclusion of the project.

8.3 Ruben

- **Introduction:** Wrote the section about the introduction of the project.
- **Technical Background:** Wrote the section about the technical background of the project.
- **Lessons Learned:** Wrote the section about the lessons learned from the project.
- **Conclusion:** Wrote the section about the conclusion of the project.

9 References

TODO