

RLOS 2022

Screening Questions

Ankit Biswas

Question 1

Compiler optimizations are required to reduce the cost of compilation and to make debugging produce the expected results. The compiler optimization tasks that I would like to tackle are -

1. GCC Flag Tuning -

In the GCC Compiler, flags are used to perform optimizations. Turning on optimization flags makes the compiler attempt to improve the performance and code size at the expense of compilation time and possibly the ability to debug the program. I want to work on this problem because GCC provides an extensive but moderately finite number of optimization levels. The required optimizations can be performed by just using the relevant flags.

2. LLVM Phase Ordering -

The LLVM is a modular compiler infrastructure used throughout academia and industry. After parsing an input source program to a language-agnostic Intermediate Representation (IR), the LLVM optimizer applies a configurable pipeline of optimization passes to the IR. The selection and

ordering of compiler optimizations– known as phase ordering– dramatically impacts the quality of the final binary and has been the focus of much research as they determine how much the compiler optimizes the intermediate representation. I want to work on it because LLVM poses a high-dimensional, highly complex optimization problem that can result in significant gains if appropriately solved.

Question 2

The projects which I have done are -

1. [Bosch Traffic Sign Recognition \(Inter IIT Silver\)](#)
2. [Digital Alpha SEC Filing Analyzer \(Inter IIT Silver\) \(Current\)](#)
3. [RL Based Stock Predictor](#)
4. [DQN for Atari Games](#)
5. [Visual ML \(Neural Style Transfer\)](#)
6. [Live Sudoku Solver](#)