

POPL 2023 Artifact Evaluation

Inductive Synthesis of Structurally Recursive Functional Programs from Non-Recursive Expressions

1 Introduction

This document describes the artifact evaluation of the paper “Inductive Synthesis of Structurally Recursive Functional Programs from Non-Recursive Expressions”. Section 2 describes the setup and Section 3 describes how to perform experiment.

The experiments take a time of 1-2 hours to complete. You can build the artifacts from the source available at https://github.com/pslhy/trio_artifacts.

Experiment Description:

- Reproduce the results of Table 2 (in Section 6.2) and Table 3 (in section 6.3) in the paper.
- Reproduce the ablation study of Section 6.3

2 Setup

To build from source, you need to install the following packages:

- cmake
- python3

Before running, you need to install the opam package manager and the OCaml compiler. The artifact is tested on macOS Big Sur and Ubuntu 16.04.7 LTS. The artifact required OCaml 4.10.0+flambda. You can automatically install the required OCaml compiler by running the following command:

```
$ git clone https://github.com/pslhy/trio_artifacts.git
$ cd trio_artifacts
$ ./build
$ . setenv (or $ bash setenv)
```

```
$ make
```

3 Running

3.1 Running All the Experiments

To run all the IO Example Benchmarks, run the following command:

```
$ python3 artifact.py io [--timeout <sec> (default: 120)]
```

The command will run each 3 tools (Trio, Burst, Smyth) for all synthesis problems with IO specifications. The results will be saved in the “results” directory. You can set a timeout by option “--timeout”. default timeout is 120 seconds.

The following command will run all the Reference Implementation Benchmarks in the paper:

```
$ python3 artifact.py ref [--timeout <sec> (default: 120)]
```

3.2 Effectiveness of Trio with IO Specifications

After the Running commands finish, you can reproduce the results of Table 2 in the paper by running the following command:

```
$ python3 artifact.py --print_stat 1
```

Note: @@@WHY DIFFERENT WITH PAPER?

3.3 Effectiveness of Trio with Ref Specifications

You can reproduce the results of Table 3 in the paper by running the following command:

```
$ python3 artifact.py --print_stat 2
```