

Ortac/QCheck-STM 0.1, Gospel 0.2

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Outline

Ortac/QCheck-STM 0.1

Gospel 0.2

Future work

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What is QCheck-STM?

QCheck-STM is a model-based testing framework that builds upon QCheck. According to a library description, it generates random programs using the functionalities of this library and runs them, records the results at each step of the run, and compares these results with the behaviour of a given pure (functional) model.

The library description contains mostly:

- a `cmd` type encoding the tested functions with their types
- how to instantiate the type we are testing (called `sut`)
- a `state` type (the model)
- a `next_state` function
- predicates for pre- and post-conditions

Towards a Gospel to QCheck-STM translation

The general context is to aim for a unified push-button experience for testing frameworks in the property based testing family (Crowbar, QCheck, QCheck-STM...).

Specify once (with Gospel) and have property based testing — with or without fuzzing — and model-based testing for free!

The Proof of Concept

Naomi Spargo build a Proof of Concept

https://github.com/naomiiiiiiiiiii/stm_ortac.

The general idea is to build on Gospel's models to implement the state type and on postconditions for the `next_state` function.

ortac the release

- reorganisation of ortac with a plugin architecture
 - less dependencies
 - fine-grain release
 - ortac-core package exposes an (use-)independant `ocaml-of-gospel` translation
- complete rewrite of Naomi's PoC

Demo

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A new `gospel.ppx`

- Build documentation attributes based on the contents of the `gospel` ones
- For instance: <https://ocaml-gospel.github.io/gospel/gospel/Gospelstdlib/index.html>
- One can also generate and install locally manpages for `Gospelstdlib`.

Other news in Gospel 0.2

- Pattern matching exhaustiveness and redundancy analysis (thanks to Paul Patault)
- Bugfixes and performance improvements of the pps
- A new `dumpast` subcommand
- Partial application allowed in Gospel terms
- Tuple destruction in anonymous functions
- Better location tracking and error messages
- Updated documentation (with typechecking of Gospel extracts)

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- battle test and improve the `qcheck-stm` plugin
- dune support for Gospel