

Principled Automatic Code Instrumentation

Proposta de Mestrado

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1 Context

This MSc Dissertation proposal aims at providing the working Ocaml programmer with automatic instrumentation tools. In particular it aims at extending and consolidating an OCaml software user base used in a teaching context. This software base is intended to be extended by users or students. For such the toolset should be able to give automatic fine grained feedback about the contribution.

These instrumentation mechanisms will take advantages of well known state-of-the-art compiler optimizations.

The instrumentation toolset should be tested and integrated in (the learn-Ocaml platform ([link](#))).

2 Objectives

The student is expected to refactor and further develop an existing OCaml core implementation.

The first proposed task: it is expected that a common algorithmic framework will (re)designed such that, for instance, each included algorithm could be executed step by step in a forward or backward (i.e. undo) fashion, and such that each algorithm comes with the ability to show its internal state (eg, via monads, CPS etc.).

Then it is expected that the student will refactor and complete the existing code base. Each included algorithm may come in two versions: a modular but direct implementation (easy to explain, easy to extend or optimize as an exercise), or a version more adapted to the step-by-step execution style and amenable to graphic visualization.

3 Plano

- Sept. - Nov. : Technological review and state of the art.
- Dec - Jan. : Architectural design fo the proposed solution.
- Fev. - Mar. : Implementation.
- Apr. Mid-May: Proof-of-concept, Validation and Verification.
- May - Jun. : Dissertation writing.

4 Contact

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