Title  From an OCaml interpreter to a pretty-big-step inductive semantics in Coq

Keywords  semantics, ocaml, coq, pretty-big-step

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Location  Celtique team, Inria Rennes

The JSExplain tool [2] is based on an interpreter written in monadic style in a tiny subset of OCaml. The goal of this internship is to design a systematic method to transform an interpreter written in the strict style of JSExplain into a set of inductive rules in pretty-big-step (PBS) style [1] to obtain a formal semantics in Coq.

More precisely, the student will rely on the front-end of our compiler from the subset of OCaml to other languages as a first step. For each construction of the subset of OCaml, they will design a transformation in PBS style, relying on monadic constructions to decide how to delegate the evaluation of subterms. If necessary, annotations to the source code of the interpreter will be added, in the form of ppx extensions.

The student will be remunerated. There is also an opportunity to continue this work as a PhD student.

The internship will be supervised by Alan Schmitt and will take place in the Celtique team at Inria Rennes. The student will have the opportunity to interact with Arthur Charguéraud who invented the PBS style.

References
