

From: Olivier Danvy danvy@cs.au.dk
Subject: Cheap (but functional) threads
Date: December 17, 2009 at 4:57 AM
To: Harrison, William L. harrisonwl@missouri.edu

OD

Dear Bill,

In a nutshell, I would like to accept your paper for publication in HOSC, modulo a minimal quantity of finalization.

And now for the rest of this e-mail:

First of all I apologize for this delayed e-mail.
I did what I could, but things always take longer, etc.

I asked for further feedback about your paper, and it was positive, so I would like to accept your submission.

So we should finalize your paper, so that we can both live with it in print. What I mean by that is that we do not want to see any of [the criticisms in your JFP reviews and in the comments below] in the related-work sections of subsequent publications. That would not help anybody, on the contrary.

I would like us to proceed in two steps:

Step #1: You send me a pointwise-annotated copy of your reviews (JFP + the comments below). Each annotation should say how you have addressed each comment. I am asking you to be frank and positive here: your paper *is* accepted, so now we both want its form to do justice to its content. So what I am asking you is to not dismiss any comment: rather, you should identify why the reviewer made this comment, and fix its cause in the paper. (As Benjamin Franklin said once, "Our critics are our friends. They show us our faults.") It is essential that the paper is as useful to its readers as humanly possible. For a simple comparison, and as you know well, the point of getting married is not the joy of the event but what happens next, counted in years; likewise, the point of a publication is not to get a paper accepted, but the hard reality of seeing it in print and of seeing it read, used, understood (or misunderstood), and also criticized. I wish for your paper to be used and to elicit good criticisms.

Step #2: Once you and I agree that all the comments are positively addressed, could you send me at your earliest convenience a tar file of the source files of your paper? I will then publish it in the very next issue of HOSC. In fact, if we converge within the coming few days, I could even insert it in the last issue of HOSC in 2009, which I am in the process of assembling now. Otherwise early 2010.

All the best, -- Olivier

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Editorial comments:

Section 2 would read better if it were structured in subsections. For example, Section 2.1 could review the four camps (each of which should be presented with a named paragraph or a numbered subsubsection; and the second one should be referred as a "camp", for consistency, not as a "model").

"---i.e., he does not use callcc or shift and reset."

->

", whether delimited or undelimited."

"wag" is too informal, and "atomic bomb" is an unnecessary metaphor.

"as most known effects may be"

-> [more definite]

"since most common effects can be"

"Programs in CPS are notoriously"

->

"On the other hand, programs in CPS are notoriously"

There is no need for Footnote 4 and for the Girard bibref.

At the end of Section 5, "Note that this denotes": (1) This what?
(2) Aren't you just talking about the meaning mentioned just above? If so how can a meaning denote something?

In general, I see that you regularly use the nouns "intent", the adjective "intentional", and the adverb "intentionally". But it is not always the most fitting word: for example, at the beginning of Section 6 (3rd line), you mean "we have deliberately made this kernel".

Bibrefs:

In addition to the tech report on the Fox project, there is also

```
@Article{Biagioni-al:HOSC01,  
  author = "Edoardo Biagioni and Robert Harper and Peter Lee",  
  title = "A Network Protocol Stack in {S}tandard {ML}",  
  journal = "Higher-Order and Symbolic Computation",  
  year = 2001,  
  volume = 14,  
  number = 4,  
  pages = "309-356"  
}
```

Here is the complete bibref for Mitch's paper:

```
@InProceedings{Wand:LFP80,  
  author = "Mitchell Wand",  
  title = "Continuation-based multiprocessing",  
  crossref = "LFP:80",  
  pages = "10-28"
```

```

pages = 12(3),
note = "Reprinted in Higher-Order and Symbolic Computation
12(3):285--299, 1999,
with a foreword~\cite{Wand:HOSC99-revisited}"
}

```

```

@Article{Wand:HOSC99-revisited,
author = "Mitchell Wand",
title = "Continuation-based multiprocessing revisited",
journal = "Higher-Order and Symbolic Computation",
year = 1999,
volume = 12,
number = 3,
pages = "283"
}

```

Technical comments:

The article illustrates the use of the resumption monad as both a semantic model and as an implementation technique for concurrent programs. The usefulness of the implementation technique is exemplified with a clear specification and implementation of an operating system kernel; and the adaptation of a basic lambda-calculus evaluator to include garbage collection.

Very readable. Clear and to the point.

Very accessible. Concepts are introduced and explained suitably and without removing focus from the main agenda.

It would be interesting to illustrate the semantic reasoning power of the approach with examples using the semantic specification, such as proving some basic (security) properties of the kernel.

* Opinions of complexity.

The article often refers to the use of monad transformers as being "easy". I slightly disagree with this. As stated in Section 3.2, the plumbing of non-proper morphisms is on a case-by-case basis (and is exponential in the number of distinct monads). I would not describe that as "easy" assuming we are not provided up-front with all of the monad transformer infrastructure.

Also, where in the literature is CPS shown to be notoriously difficult to reason about? Such a claim should be backed by an argument. The ability to reason about, and the ability to understand are distinct issues, the later being much more subjective than the former. Also, it would be hard to make the case that layered monads are more understandable than CPS or various direct style control operators.

* On the type of requests and responses

The implementation presented requires that every request continuation be able to handle any one of the responses in the sum type Rsp. Can the approach be refined to have a per-request response-type?

* Minor comments:

Footnote on page 1: "my paper" -> "the first author's paper"

Section 1, page 2: "is stream-like" -> "is a stream-like"

Section 2, page 4: "most known" -> "all known"

Section 2, page 6: On "Some of these impurities have been handled". What does "these" refer to? and could it be strengthened to "All of these" or simply "These"?

Section 3.2, page 10: I find the comma at "typed, uninterpreted" disturbs the reading of the sentence.

Section 3.2, page 10: "re-interpreted at different monads"
Should "monads" be "layered monads"?

Section 6.5, page 25: My understanding of "preemption" is the ability to interrupt a running thread. I.e., put it on the waiting queue and not killing it altogether.

Section 4, page 11: "en dash" (--) -> "em dash" (---) at "used here--what we call".

* Some closely related work that would merit mention and comparison.

- Delimited continuations in operating systems
Oleg Kiselyov and Chung-chieh Shan.
In Proceedings of the conference on modeling and using context,
ed. Boicho Kokinov, Daniel C. Richardson, Thomas R. Roth-Berghofer,
and Laure Vieu, 291-302. Lecture notes in computer science 4635,
Springer, 2007. Posters at USENIX technical conference and at
CONTEXT.

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