A Denotational Semantics for a polymorphic Effects Systems

A PartIII project proposal

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Abstract

A category theoretic approach to build a graded monad based denotational semantics for a polymorphic effects system.

1   Introduction, approach and outcomes (500 words)

Provide an introduction to your project or essay. In particular, try to motivate the work and explain the relevant context (general background, as well as sufficient detail about any related work).

What's the basic idea and approach? What are you thinking of doing, and how is it going to solve the problem (or need) you've identified. What are you going to "produce"? A project will typically produce one (or perhaps more) of the following: a piece of software, an evaluation of a published result, a proof, or the design (and perhaps the construction of) a new piece of hardware. An essay will typically either review and critique a particular area of the academic literature, or evaluate a published result or proof. Try to name the specific things (and describe them) in this part of the proposal – this will allow you to refer to them in the next.

2   Workplan (500 words)

Project students have approximately 26 weeks between the approval of the proposal by the Head of Department, and the submission of the dissertation. This section should account for what you intend to do during that time. You should divide the time into two-week chunks including dates, and describe the work to be done (and, as relevant, milestones to be achieved) in each chunk. You should leave two chunks for writing a project dissertation. You should leave 1 chunk for contingencies.

November	Plan + read
December	Construct a simple monadic lambda calculus based language with a type system and operational semantics, prove simple properties
January	Explore the effects of different kernels (e.g. Identity kernel for STLC, Optional kernel for PCF, full kernel for a simple imperatiive language)
February	add polymorphism
March	Contingency
April	Collate results
May	write dissertation