Advanced functional programming

Jeremy Yallop

(January 2018)

Organisational

Lectures

Mon & Thu

Material

Lecture notes

Online notebooks

Further reading

Assessment

3 take-home exercises

Mailing list

Questions

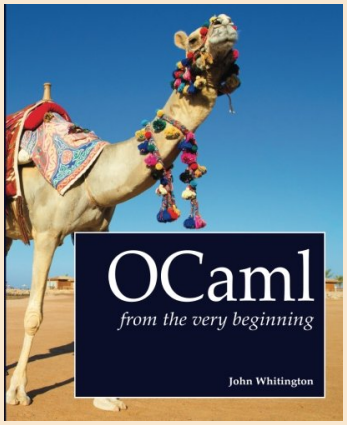
Always welcome!

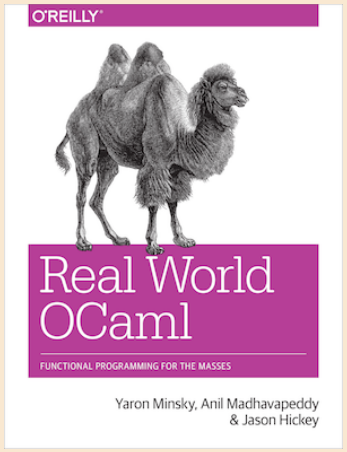
In class

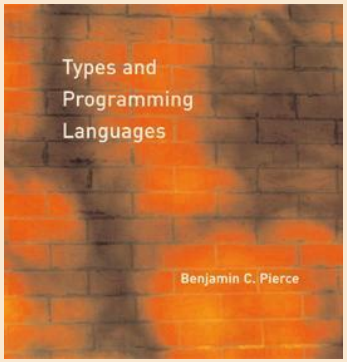
Via email

Adddditional support

Arrange a meeting







Mailing list

cl-acs-28@lists.cam.ac.uk

Announcements, questions and discussion. Feel free to post!

Have a question but feeling shy? Mail me directly and I'll anonymise and post your question:

jeremy.yallop@cl.cam.ac.uk

Exercises assessed and unassessed

Unassessed exercises

Useful preparation for assessed exercises; optional but recommended. Hand in for feedback, discuss freely on mailing list.

Assessed exercises

Mon 29 Jan	Mon 19 Feb	Mon 12 Mar
$\downarrow$	$\downarrow$	$\downarrow$
Mon 12 Feb	Mon 5 Mar	Tue 24 Apr
($\sim$25%)	($\sim$35%)	($\sim$40%)

OPAM

OCaml package manager

Linux / OSX / VirtualBox

IOCaml

$\mathrm{F}\omega$

$\mathrm{F}\omega$ interpreter

Agda

Philosophical & Structural

Practical

with theory as necessary for understanding

Real-world

patterns & techniques from real applications

Reusable

general, broadly applicable techniques

Current

topics of recent & ongoing research

Theme-structured

recurring ideas, gradually interwoven

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Opinionated

(but there's no obligation to agree)

Thematic: what is a type?

A **type** is . . .

. . . a **formula** in a formal system (this lecture)
to be manipulated without understanding

. . . an approximation of a program's **behaviour** (lecture 2)
guaranteeing *probity*

. . . a logical **proposition** (lecture 3)
(what do types have to do with *logic*?)

. . . a **relation** between terms (lectures 4-5)
that somehow relates to *abstraction*

. . . an element in a **semiring** (lecture 6)
i.e. something that supports *arithmetic*