What on Earth
is
Open Source?!

observations from
the Joint European Conferences
on
Theory and Practice of Software
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ETAPS Overview

- CC — International Conference on Compiler Construction
- ESOP — European Symposium on Programming
- FASE — Fundamental Approaches to Software Engineering
- FOSSACS — Foundations of Software Science and Computation Structures
- TACAS — Tools and Algorithms for the Construction and Analysis of Systems
- *plus 22 satelite workshops. . .*

The ETAPS Community

- Bearded Oxford professors and their PhD students
- Geeks like us, except:

THE ETAPS COMMUNITY

- ➜ Bearded Oxford professors and their PhD students
- ➜ Geeks like us, except:
  - ☒ Most wear suits
  - ☒ Most use PowerPoint
  - ☒ Most don't mind going to an invited lecture from Microsoft
  - ☒ Many have never run a C compiler
  - ☒ Most have wives and/or girlfriends
  - ☒ All talk all day in Greek that's all English to the Greeks.

A FRAGMENT OF SCC_{ANF}

$$\mathcal{A}[\![v]\!] \quad \Gamma \quad \Omega \quad = \langle \Gamma v, \Gamma, \Omega \rangle$$

$$\mathcal{A}[\![f(v_1, \ldots, v_n)]\!] \quad \Gamma \quad \Omega$$

$$\mid f \in \textbf{Prim} \quad = \mathcal{E}_{\textbf{Abs}}[\![f(\Gamma v_1, \ldots, \Gamma v_n)]\!]$$

$$\mid \text{otherwise} \quad = \langle \Gamma' f, \Gamma', \textbf{if } changed \textbf{ then } \Omega \cup \{f\} \textbf{ else } \Omega \rangle$$

where

f is defined as $f(x_1, \ldots, x_n) = e$

$$\Gamma' = \Gamma \sqcap [f \mapsto \bot, x_1 \mapsto \Gamma v_1, \ldots, x_n \mapsto \Gamma v_n]$$

$$changed = \exists i. \Gamma x_i \sqsubset \Gamma v_i$$ — indicates whether Γ changed

$$\mathcal{A}[\![\texttt{letrec } f_1, \ldots, f_n \texttt{ in } e]\!]\Gamma \quad \Omega \quad =$$

let

$$\langle a, \Gamma', \Omega' \rangle = \mathcal{A}[\![e]\!]\Gamma\{\}$$

$$\langle \Gamma'', \Omega'' \rangle = \mathcal{A}_{\text{fix}}[\![f_1, \ldots, f_n]\!]\Gamma'(\Omega \cup \Omega')$$

in

$$\textbf{if } \Gamma' == \Gamma'' \textbf{ then } \langle a, \Gamma', \Omega'' \rangle \textbf{ else } \mathcal{A}[\![\texttt{letrec } f_1, \ldots, f_n \texttt{ in } e]\!]\Gamma''\Omega''$$

$$\mathcal{A}_{\text{fix}}[\![fun_1, \ldots, fun_n]\!]\Gamma\Omega \quad \mid \nexists i. f_i \in \Omega = \langle \Gamma, \Omega \rangle$$

$$\mid \text{otherwise} \quad =$$

let

$$\langle a, \Gamma', \Omega' \rangle = \mathcal{A}[\![e]\!]\Gamma\{\}$$

$$\Gamma'' = \Gamma' \sqcap [f_i \mapsto a]$$

$$\Omega'' = \Omega \cup \Omega' \setminus \{f_i\}$$

in

$$\mathcal{A}_{\text{fix}}[\![fun_1, \ldots, fun_n]\!]\Gamma''(\textbf{if } \Gamma f_i \sqsubset \Gamma a \textbf{ then } \Omega'' \cup (\mathrm{Occ}\, f_i \cap \mathrm{Dom}\, \Gamma) \textbf{ else } \Omega'')$$

where

$$(f_i(x_1, \ldots, x_m) = e) = fun_i$$

Attitudes to Open Source

- Peyton-Jones: a matter of fact
- Abramsky: curiousity
- Tony Hoare: a fountain of test cases

"A MATTER OF FACT"

Remember UN*X at Berkeley?

- ➜ Academia is not about releasing software, it's about publishing papers
- ➜ Don't care about:
  - ✗ how the source code looks
  - ✗ licencing, just a fact of life
  - ✗ engineering benefits of open source
  - ✗ Richard Stallman
- ➜ Care about:
  - ☑ sharing of ideas
  - ☑ benchmarks and graphs
  - ☑ reuse of boring work
  - ☑ bragging
- ➜ Finished, specialized software with a commercial potential likely to be closed-source.

"A Curiosity"

Just like any other computer user:

- What's all the fuss about?
- What's the difference anyway?
- What's the gain?
- "If someone needs my stuff for their research, they can call my secretary and she'll send it to them."
- "Software is software, it's meant to be run not worshipped."

"A Fountain of Test Cases"

From Tony Hoare's *The Verified Compiler: A Grand Challenge for Computing Research:*

- "The corpus of Open Source Software is now universally available and used by millions, so justifying almost any effort expanded on improvement of its quality and robustness."
- "For the first time, a large volume of real-life source code is available to test the success or failure of a software verification project."

Conclusion - So, what do I say to Abramsky?

Open Source is the journal of Software Development

- ☑ If I need a tool, I don't care about the source code.
- ☑ I need the source code for critical analysis; to evaluate the author's achievements in the field of software development.
- ☑ Open source projects are truly international.
- ☑ Open source projects facilitate peer review to the highest possible standards.
- ☑ An extremely successful method of software engineering.