

== Communication-based Computation ==
May, 8 2014

The first meeting on Communication-based Computation (CoCo) was held in May, the 8th 2014 in Cameron House, in Loch Lomond.

The organisers were

Ornela Dardha (Ornela.Dardha@glasgow.ac.uk)
Sam Lindley (Sam.Lindley@ed.ac.uk)
Simon Gay (Simon.Gay@glasgow.ac.uk)
Philip Wadler (wadler@inf.ed.ac.uk)

Abstract of the meeting:

Computation increasingly depends on communication: in distributed systems, in the cloud, in multi-threaded applications, in mobile applications, in parallel supercomputers, and within many-core architectures. The rise of communication-based computation is presenting new challenges for programming languages and abstractions for parallelism and communication; compilation techniques; computer architecture; algorithm design; software engineering; testing and verification. CoCo will bring together Scottish researchers from across these areas with the aim of reaching a common understanding of key problems and instigating collaborations.

There were 29 participants with the following affiliation. (We had originally 30 people, however, one person was ill and could not attend)

Edinburgh: 10

Glasgow: 6

Heriot Watt: 4

Dundee: 2

St Andrews: 2

Glasgow Caledonian: 1

Napier: 1

Strathclyde: 1

Industry: 2

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Programme

10.00 - 10.10 Welcome Refreshment

10.10 - 10.15 Introduction by Phil Wadler

10.15 - 11.30 Languages (Session Leader: Simon Gay)

10.15 - 10.30 Simon Gay (Glasgow): Behavioural Type Systems

10.30 - 10.45 Philip Wadler (Edinburgh): From Data Types to Session Types: A Basis for Concurrency and Distribution

10.45 - 11.00 Conor McBride (Strathclyde): Worldly Type Systems

11.00 - 11.15 Ekaterina Komendantskaya (Dundee): Can CoALP be useful for CoCo?

11.15 - 11.30 Ian Stark (Edinburgh): Continuous pi-calculus and computation in biochemical systems

11.30 - 11.45 Tea/coffee break

11.45 - 13.00 Architectures (Session Leader: Murray Cole)

11.45 - 11.55 Vijayanand Nagarajan (Edinburgh): Consistency models: convergence between Architecture and OS/DS/DB Communities

11.55 - 12:05 Wim Vanderbauwhede (Glasgow): A Million-Core Accelerator

12:05 - 12.15 Rik Sarkar (Edinburgh): Distributed Information Processing for Sensor Networks

12.15 - 12.25 Chris Fensch (Heriot-Watt): Hardware Support for Pattern based Programming in Future Architectures

12.35 - 12.45 Christophe Dubach (Edinburgh): Towards Performance Portability for Heterogeneous Systems: a Unified View of Algorithm Choices and Hardware Optimisations

12.45 - 12.55 Murray Cole (Edinburgh): Patterns and Parallelism

13.00 - 14.00 Lunch

14.00 - 15.15 Compilers (Session Leader: Kevin Hammond)

14.00 - 14.10 Compiler Group Overview

14.10 - 14.25 Kevin Hammond (St Andrews): Refactoring, Functional Programming, Timing Analysis

14.25 - 14.40 Hans-Wolfgang Loidl (Heriot-Watt): High-Level Parallel Programming, Static Analysis

14.40 - 14.55 Phil Trinder (Glasgow): Parallel and Distributed Haskell/Erlang

14.55 - 15.05 Sven Bodo Scholz (Heriot-Watt): The SaC Compiler

15.05 - 15.15 Jeremy Singer (Glasgow): Memory management and workloads in the cloud

15.15 - 15.45 Tea/coffee break

15.45 - 18.00 Discussion

18.00 End / Pub / Food

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Catering was provided by Cameron House.

As shown by the above programme, it covered a welcome refreshment, two coffee break and lunch for all the participants.

We spent £1500 overall.

This first meeting was a success for various reasons:

First of all, everyone met new people, so we succeed in helping to make new contacts.

There were many talks, each of 10/15 mins. The talks grouped into sessions covering different themes; speakers made an effort to introduce their topic to non-specialists.

Several of those provoked lively discussions. In particular, there was a long discussion at the end about the possibility of establishing a set of challenge problems in order to compare different approaches to communication-based computation; discussion will continue by email.

We agreed that a follow-up meeting, as originally proposed, would be useful.

Further details can be found in the web page of the meeting:

<http://www.dcs.gla.ac.uk/coco>.