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Chairs' Welcome

It is our great pleasure to welcome you to Gothenburg for the 19th ACM SIGPLAN International Conference on Functional Programming: ICFP 2014.

This year's conference continues its tradition as a forum for researchers, developers, and students to discuss the latest work on the design, implementation, principles, and use of functional programming. The conference covers the entire spectrum, from theory to practice.

This year's call for papers attracted 97 submissions: 85 regular research papers, 9 functional pearls and 3 experience reports. Out of these, the program committee accepted 28 papers, two of which are functional pearls and another two are experience reports. In addition to these papers, the technical program includes three invited keynotes: "Using Formal Methods to Enable More Secure Vehicles: DARPA's HACMS Program" by Kathleen Fisher, "Behavioral Software Contracts" by Robby Findler, and "Depending on Types" by Stephanie Weirich. All three keynote presentations address topics that are currently of high relevance and are presented by leading researchers in these areas.

As usual, the main conference is complemented by a range of affiliated events as well as the ICFP Programming Contest, whose results are announced during the conference. This year, ICFP comes with eleven affiliated events covering a wide range of specialist topics, from functional art and music to high-performance computing. Moreover, the tutorials, talks, and BoFs under the umbrella of the Commercial Users of Functional Programming (CUFP) workshop focus on the application of functional programming in modern software development and industrial practice.

With the increasing popularity of functional programming, ICFP is steadily growing and its success depends on an ever larger number of researchers, developers, and volunteers: the authors of research papers who entrust their precious work to ICFP, the many reviewers who generously donate their time, the participants in the programming competition, and the steadily growing list of organisers and volunteers whose work enables ICFP. We like to specifically acknowledge the excellent work of the local organisers, Björn von Sydow and his team as well as Annabel Satin; Anil Madhavapeddy, who liaised with our industrial sponsors; Tom Schrijvers and Sam Tobin-Hochstadt for overseeing the organisation of the workshops; David Van Horn for spreading the word about ICFP; and, last but not least, Duncan Coutts and Nicolas Wu for shouldering the challenging task of organising the programming contest.

We are indebted to our sponsors who made it possible to keep registration cost reasonable and who kindly supported students who would not have been able to attend the conference without financial aid. Their generosity helps our community to grow and thrive.

We hope that you enjoy, as a conference attendee or reader of the proceedings, the conference and affiliated events and benefit from the wide array of technical work.

Johan Jeuring
ICFP'14 General Chair
Universiteit Utrecht, The Netherlands

Manuel M. T. Chakravarty
ICFP'14 Program Chair
University of New South Wales, Australia

ICFP (Day 1)

08:45 – 09:00 **Opening (General Chair)**

09:00 – 10:00 **Keynote** Chair: Manuel Chakravarty

09:00 Using Formal Methods to Enable More Secure Vehicles: DARPA's HACMS Program
Kathleen Fisher (Tufts University)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Session 1: Domain Specific Languages I** Chair: Anil Madhavapeddy

10:30 Building Embedded Systems with Embedded DSLs (Experience Report)
Patrick Hickey, Lee Pike, Trevor Elliott, James Bielman, John Launchbury (Galois Inc)

10:55 Concurrent NetCore: From Policies to Pipelines
Cole Schlesinger, Michael Greenberg, David Walker (Princeton University)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 2: Static Analysis** Chair: Ken Friis Larsen

11:40 SeLINQ: Tracking Information Across Application-Database Boundaries
Daniel Schoepe, Daniel Hedin, Andrei Sabelfeld (Chalmers University of Technology)

12:05 Type-Based Parametric Analysis of Program Families
Sheng Chen, Martin Erwig (Oregon State University)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 3: Binding Structure** Chair: Tarmo Uustalu

14:00 Romeo: A System for More Flexible Binding-Safe Programming
Paul Stansifer, Mitchell Wand (Northeastern University)

14:25 Maximal Sharing in the Lambda Calculus with letrec
Clemens Grabmayer (VU University Amsterdam), Jan Rochel (Universiteit Utrecht)

14:50 – 15:10 **Break**

15:10 – 16:00 **Session 4: Program Optimisation** Chair: John Launchbury

15:10 Practical and Effective Higher-Order Optimizations
Lars Bergstrom (Mozilla Research), Matthew Fluet (Rochester Institute of Technology), John Reppy, Nora Sandler (University of Chicago), Matthew Le (Rochester Institute of Technology)

15:35 Worker/Wrapper/Makes It/Faster
Jennifer Hackett, Graham Hutton (University of Nottingham)

16:00 – 16:30 **Tea break**

16:30 – 17:20 **Session 5: Context Dependence** Chair: Yukiyoshi Kameyama

16:30 Compositional Semantics for Composable Continuations: From Abortive to Delimited Control
Paul Downen, Zena M. Ariola (University of Oregon)

16:55 Coeffects: A Calculus of Context-Dependent Computation
Tomas Petricek, Dominic Orchard, Alan Mycroft (University of Cambridge)

17:20 – 17:45 **Program Chair's Report**

ICFP (Day 2)

09:00 – 10:00 **Keynote** Chair: Jesse Tov

09:00 Behavioral Software Contracts
Robert Bruce Findler (Northwestern University)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Session 6: Contracts** Chair: Michael Sperber

10:30 Soft Contract Verification
Phuc Nguyen (University of Maryland), Sam Tobin-Hochstadt (Indiana University), David Van Horn (University of Maryland)

10:55 On Teaching 'How to Design Programs': Observations from a Newcomer
Norman Ramsey (Tufts University)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 7: Tools Used in Anger** Chair: Jacques Garrigue

11:40 SML# in Industry: A Practical ERP System Development (Experience Report)
Atsushi Ohori, Katsuhiro Ueno (Tohoku University), Kazunori Hoshi, Shinji Nozaki, Takashi Sato, Tasuku Makabe, Yuki Ito (NEC Software Tohoku, Ltd.)

12:05 Lem: Reusable Engineering of Real-World Semantics
Dominic P. Mulligan (University of Cambridge), Scott Owens (University of Kent), Kathryn E. Gray (University of Cambridge), Tom Ridge (University of Leicester), Peter Sewell (University of Cambridge)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 8: Type Systems** Chair: Mainland Geoffrey

14:00 Safe Zero-Cost Coercions for Haskell
Joachim Breitner (Karlsruhe Institute of Technology), Richard A. Eisenberg (University of Pennsylvania), Simon Peyton Jones (Microsoft Research), Stephanie Weirich (University of Pennsylvania)

14:25 Hindley-Milner Elaboration in Applicative Style (Functional Pearl)
Francois Pottier (INRIA)

14:50 – 15:10 **Break**

15:10 – 16:00 **Session 9: Incremental Computing** Chair: Tiark Rompf

15:10 Settable and Non-Interfering Signal Functions for FRP
Daniel Winograd-Cort, Paul Hudak (Yale University)

15:35 Functional Programming for Dynamic and Large Data with Self-Adjusting Computation
Yan Chen (Max Planck Institute for Software Systems), Umut Acar (Carnegie Mellon University), Kanat Tangwongsan (Mahidol University)

16:00 – 16:30 **Tea break**

16:30 – 17:10 **ICFP Programming Contest Presentation**

17:10 – 17:30 **ICFP 2004 Most Influential Paper Award**

ICFP (Day 3)

09:00 – 10:00 **Keynote** Chair: Edwin Brady

09:00 Depending on Types
Stephanie Weirich (University of Pennsylvania)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Session 10: Homotopy Type Theory** Chair: Derek Dreyer

10:30 Homotopical Patch Theory
Carlo Angiuli, Ed Morehouse (Carnegie Mellon University), Daniel Licata (Wesleyan University), Robert Harper (Carnegie Mellon University)

10:55 Pattern Matching without K
Jesper Cockx, Dominique Devriese, Frank Piessens (KU Leuven)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 11: Abstract Interpretation** Chair: Patricia Johann

11:40 Refinement Types For Haskell
Niki Vazou, Eric L. Seidel, Ranjit Jhala (UC San Diego), Dimitrios Vytiniotis, Simon Peyton-Jones (Microsoft Research)

12:05 A Theory of Gradual Effect Systems
Felipe Bañados Schwerter (University of Chile), Ronald Garcia (University of British Columbia), Éric Tanter (University of Chile)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 12: Dependent Types** Chair: Ulf Norell

14:00 How to Keep Your Neighbours in Order
Conor McBride (University of Strathclyde)

14:25 A Relational Framework for Higher-Order Shape Analysis
Gowtham Kaki, Suresh Jagannathan (Purdue)

14:50 – 15:10 **Break**

15:10 – 16:00 **Session 13: Domain Specific Languages II** Chair: Yaron Minsky

15:10 There is no Fork: an Abstraction for Efficient, Concurrent, and Concise Data Access
Simon Marlow, Louis Brandy, Jonathan Coens, Jon Purdy (Facebook)

15:35 Folding Domain-Specific Languages: Deep and Shallow Embeddings (Functional Pearl)
Jeremy Gibbons, Nicolas Wu (University of Oxford)

16:00 – 16:30 **Tea break**

16:30 – 17:20 **Session 14: Abstract Machines** Chair: David Van Horn

16:30 Krivine Nets
Olle Fredriksson, Dan Ghica (University of Birmingham)

16:55 Distilling Abstract Machines
Beniamino Accattoli (University of Bologna), Pablo Barenbaum (University of Buenos Aires), Damiano Mazza (Université Paris 13)

17:20 – 17:40 **Student Research Competition Award Presentation**

17:40 – 18:00 **ICFP 2015 Advert and Closing**

Workshop on Higher-Order Programming with Effects

09:00 – 10:00 **Session 1** Chair: Neel Krishnaswami

09:00 Welcome
Neel Krishnaswami (University of Birmingham), Hongseok Yang (University of Oxford)

09:10 Verifying Security Properties of SES Programs
Philippa Gardner (Imperial College)

10:00 – 10:30 **Coffee break**

10:30 – 12:00 **Session 2** Chair: Ohad Kammar

10:30 Towards indexed algebraic effects and handlers
Stevan Andjelkovic (Strathclyde University)

11:00 From stateful to stackful computation
Danel Ahman (University of Edinburgh), Tarmo Uustalu (Tallinn University of Technology)

11:30 Separating Entangled State
Kwok Cheung (University of Oxford)

12:00 – 14:00 **Lunch**

14:00 – 15:30 **Session 3** Chair: Hongseok Yang

14:00 Graphical Algebraic Foundations for Monad Stacks
Ohad Kammar (University of Cambridge)

14:30 Delimited control with multiple prompts in theory and practice
Paul Downen (University of Oregon), Zena M. Ariola (University of Oregon)

15:00 A Type Directed model of Memory Locality and the design of High Performance Array APIs
Carter Schonwald (WellPosed Limited)

15:30 – 16:00 **Tea break**

16:00 – 17:00 **Session 4** Chair: Scott Owens

16:00 Compositional Compiler Verification via Parametric Simulation
Georg Neis (MPI-SWS), Chung-Kil Hur (Seoul National University), Jan-Oliver Kaiser (MPI-SWS), Derek Dreyer (MPI-SWS), Viktor Vafeiadis (MPI-SWS)

16:30 ModuRes: a Coq Library for Reasoning about Concurrent Higher-Order Imperative Programming Languages
Filip Sieczkowski (Aarhus University), Lars Birkedal (Aarhus University)

Workshop on Generic Programming

09:00 – 09:10 **Welcome**

09:10 – 10:00 **Session 1 (invited talk)**

09:10 Functional Programming, Object-Oriented Programming and Algebras!
Bruno C. d. S. Oliveira (The University of Hong Kong)

10:00 – 10:30 **Coffee break**

10:30 – 12:00 **Session 2**

10:30 Generic Constructors and Eliminators from Descriptions
Larry Diehl, Tim Sheard (Portland State University)

11:00 Ornaments in Practice
Thomas Williams, Pierre-Évariste Dagand, Didier Rémy (Inria)

11:30 Type Inference for the Spine View of Data
Matthew Roberts, Tony Sloane (Macquarie University)

12:00 – 14:00 **Lunch**

14:00 – 15:30 **Session 3**

14:00 First-class Isomorphic Specialization by Staged Evaluation
Alexander Slesarenko, Alexander Filippov, Alexey Romanov (Huawei Technologies)

14:30 Algebraic Effects and Effect Handlers for Idioms and Arrows
Sam Lindley (University of Edinburgh)

15:00 Scoping Rules on a Platter – A Framework for Understanding and Specifying Name Binding
Larisse Voufo, Marcin Zalewski, Andrew Lumsdaine (Indiana University)

15:30 – 16:00 **Tea break**

16:00 – 17:00 **Session 4**

16:00 Composing and Decomposing Data Types – A Closed Type Families Implementation of Data Types à la Carte
Patrick Bahr (Department of Computer Science, University of Copenhagen)

16:30 True Sums of Products
Edsko de Vries, Andres Löh (Well-Typed LLP)

Haskell Symposium, Day 1

09:00 – 10:00 **Session 1**

09:00 Invited Talk
Patricia Johann (Appalachian State University)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Session 2**

10:30 Effect Handlers in Scope
Nicolas Wu (University of Oxford), Tom Schrijvers (Ghent University), Ralf Hinze (University of Oxford)

10:55 Embedding Effect Systems
Dominic Orchard, Tomas Petricek (University of Cambridge)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 3**

11:40 The Next 1100 Haskell Programmers (Experience Report)
Jasmin Christian Blanchette, Lars Hupel, Tobias Nipkow, Lars Noschinski, Dmitriy Traytel (Technische Universität München)

12:05 Type-checking Polymorphic Units for Astrophysics Research in Haskell (Experience Report)
Takayuki Muranushi (The Hakubi Center for Advanced Research, Kyoto University), Richard A. Eisenberg (University of Pennsylvania)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 4**

14:00 LiquidHaskell: Refinement Types for the Real World
Niki Vazou, Eric L. Seidel, Ranjit Jhala (University of California, San Diego)

14:25 SmartCheck: Automatic and Efficient Counterexample Reduction and Generalization
Lee Pike (Galois, Inc.)

14:50 – 15:10 **Break**

15:10 – 16:00 **Session 5**

15:10 The HdpH DSLs for Scalable Reliable Computation
Patrick Maier (University of Glasgow), Robert Stewart (Heriot Watt University), Phil Trinder (University of Glasgow)

15:35 Writing NetBSD Sound Drivers in Haskell (System Demonstration)
Kiwamu Okabe (Metasepi Design), Takayuki Muranushi (Hakubi Center, Kyoto University)

16:00 – 16:30 **Tea break**

16:30 – 17:30 **Session 6**

16:30 A seamless, client-centric programming model for type safe web applications
Anton Ekblad, Koen Claessen (Chalmers University of Technology)

16:55 Making Web Applications -XSafe (System Demonstration)
Amit Levy, David Terei, Deian Stefan, David Mazieres (Stanford University)

17:15 Building Secure Systems with LIO (System Demonstration)
Deian Stefan (Stanford University), Alejandro Russo (Chalmers University of Technology)

ML Family Workshop

09:00 – 09:10 **Welcome**

09:10 – 10:00 **Module Systems**

09:10 1ML – core and modules as one (Or: F-ing first-class modules) (Research presentation)
Andreas Rossberg

09:35 Type-level module aliases: independent and equal (Research presentation)
Jacques Garrigue (Nagoya University), Leo White (University of Cambridge)

10:00 – 10:30 **coffee break**

10:30 – 11:20 **Verification**

10:30 Well-typed generic smart-fuzzing for APIs (Experience report)
Thomas Braibant (Cryptosense), Jonathan Protzenko, Gabriel Scherer (INRIA)

10:55 Improving the CakeML Verified ML Compiler (Research presentation)
Ramana Kumar, Magnus O. Myreen (University of Cambridge), Michael Norrish (NICTA), Scott Owens (University of Kent)

11:20 – 11:40 **break**

11:40 – 12:30 **Beyond Hindley-Milner**

11:40 The Rust Language and Type System (Demo)
Felix Klock, Nicholas Matsakis (Mozilla Research)

12:05 Doing web-based data analytics with F# (Informed Position)
Tomas Petricek (University of Cambridge), Don Syme (Microsoft Research Cambridge)

12:30 – 14:00 **lunch**

14:00 – 14:50 **Implicits**

14:00 Implicits in Practice (Demo)
Nada Amin (EPFL), Tiark Rompf (EPFL & Oracle Labs)

14:25 Modular implicits (Research presentation)
Leo White, Frédéric Bour (University of Cambridge)

14:50 – 15:10 **break**

15:10 – 16:00 **To the bare metal**

15:10 Metaprogramming with ML modules in the MirageOS (Experience report)
Anil Madhavapeddy, Thomas Gazagnaire (University of Cambridge), David Scott (Citrix Systems R&D), Richard Mortier (University of Nottingham)

15:35 Compiling SML# with LLVM: a Challenge of Implementing ML on a Common Compiler Infrastructure (Research presentation)
Katsuhiro Ueno, Atsushi Ohori (Tohoku University)

16:00 – 16:30 **tea break**

16:30 – 17:20 **No longer foreign**

16:30 A Simple and Practical Linear Algebra Library Interface with Static Size Checking (Experience report)
Akinori Abe, Eijiro Sumii (Tohoku University)

16:55 SML3d: 3D Graphics for Standard ML (Demo)
John Reppy (University of Chicago)

Workshop on Functional High-Performance Computing

09:00 – 10:00 **Welcome and Invited Talk** Chair: Mary Sheeran

09:00 Chairs' Welcome to FHPC 2014
Mary Sheeran

9:05 Ziria: wireless programming for hardware dummies (invited talk)
Dimitrios Vytiniotis (Microsoft Research Cambridge)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Applications** Chair: Ryan Newton

10:30 Pension Reserve Computations on GPUs
Christian Harrington, Nicolai Dahl, Peter Sestoft, David Raymond Christiansen (IT University of Copenhagen)

10:55 Parallel Computation of Multifield Topology: Experience of Haskell in a Computational Science Application
David Duke, Fouzhan Hosseini, Hamish Carr (University of Leeds)

11:20 – 11:40 **Break**

11:40 – 12:30 **Compilation I** Chair: Clemens Grelck

11:40 An efficient representation for lazy constructors using 64-bit pointers
Georgios Fourtounis, Nikolaos Papaspyrou (National Technical University of Athens)

12:05 Size Slicing - A Hybrid Approach to Size Inference in Futhark
Troels Henriksen, Martin Elsman, Cosmin E.Oancea (University of Copenhagen)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Optimizing Compilation** Chair: Dimitrios Vytiniotis

14:00 Defunctionalizing Push Arrays
Joel Svensson, Josef Svenningsson (Chalmers University of Technology)

14:25 Fusing Filters with Integer Linear Programming
Amos Robinson, Ben Lippmeier, Gabriele Keller (University of New South Wales)

14:50 – 15:10 **Break**

15:10 – 16:00 **Programming Patterns** Chair: Tiark Rompf

15:10 Lazy Data-Oriented Evaluation Strategies
Prabhat Totoo, Hans-Wolfgang Loidl (Heriot-Watt University)

15:35 Group Communication Patterns for High Performance Computing in Scala
Felix Hargreaves, Daniel Merkle, Peter Schneider-Kamp (University of Southern Denmark)

16:00 – 16:30 **Tea break**

16:30 – 17:30 **Compilation II (heterogeneous systems) and Concluding Discussion** Chair: Jost Berthold

16:30 Native Offload of Haskell Repa Programs to GPGPU
Hai Liu, Laurence Day, Neal Glew, Todd Anderson, Rajkishore Barik (Intel Labs)

16:55 LambdaJIT: A Dynamic Compiler for Heterogeneous Optimizations of STL Algorithms
Thibaut Lutz (University of Edinburgh), Vinod Grover (NVidia Corporation)

17:20 Concluding discussion
Jost Berthold, Mary Sheeran, Ryan Newton

CUFP Tutorials, Day 1

09:00 – 12:30 **Morning Tutorials**		**Room**
T1	Programming with Dependent Types *Ulf Norell (Gothenburg University)*	R4
T2	Haskell in the Real World *Stefan Wehr (factis research GmbH)*	R2
T3	Intro to Elm: a field guide for functional front-end programming (Part 1) *Evan Czaplicki (Prezi), Spiros Eliopoulos (Cornell)*	R26

12:30 – 13:30 **Lunch**

13:30 – 17:00 **Afternoon Tutorials**		**Room**
T4	Elm-d3: Front-end Development without Frameworks (Part 2) *Spiros Eliopoulos (Cornell)*	R26
T5	Idris: Practical Software Verification with Dependent Types *Edwin Brady (University of St Andrews)*	R2
T6	Lens *Edward Kmett (S&P Capital IQ)*	R4

Haskell Symposium, Day 2

09:00 – 10:00 **Invited Talk**

09:00 Invited Talk
Anil Madhavapeddy (University of Cambridge)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Session 2**

10:30 Promoting Functions to Type Families in Haskell
Richard A. Eisenberg (University of Pennsylvania), Jan Stolarek (Łódź University of Technology)

10:55 A Simple Semantics for Haskell Overloading
J. Garrett Morris (University of Edinburgh)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 3**

11:40 PC Chair Report
Wouter Swierstra (University of Utrecht)

11:50 Future of Haskell Discussion

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 4**

14:00 Foreign Inline Code (System Demonstration)
Manuel Chakravarty (University of New South Wales)

14:25 Indentation-Sensitive Parsing for Parsec
Michael D. Adams (University of Illinois at Urbana-Champaign), Ömer Sinan Ağacan (TOBB University of Economics and Technology)

14:50 – 15:10 **Break**

15:10 – 15:45 **Session 5**

15:10 Reflection without Remorse: Revealing a hidden sequence to speed up monadic reflection
Atze van der Ploeg (Centrum voor Wiskunde & Informatica, Amsterdam), Oleg Kiselyov (self)

15:35 Closure

OCaml Users and Developers Workshop

09:00 - 09:10 **Welcome**

09:10 - 10:00 **Runtime system**

09:10 Multicore OCaml — *Stephen Dolan, Leo White, Anil Madhavapeddy (University of Cambridge)*

09:35 Ephemerons meet OCaml GC — *François Bobot (CEA)*

10:00 - 10:25 **Coffee break**

10:25 - 11:20 **Tools and libraries**

10:25 Introduction to 0install — *Thomas Leonard (University of Cambridge)*

10:50 Transport Layer Security purely in OCaml — *Hannes Mehnert (University of Cambridge), David Kaloper Meršinjak (University of Nottingham)*

11:05 A New OCaml API Search — *Jun Furuse (Standard Chartered Bank, Singapore)*

11:20 - 11:40 **Break**

11:40 - 12:30 **OCaml News**

11:40 The State of OCaml (invited) — *Xavier Leroy (INRIA Paris-Rocquencourt)*

12:05 The OCaml Platform v1.0 — *Anil Madhavapeddy, Amir Chaudhry, Thomas Gazagnaire, Thomas Leonard, David Sheets, Leo White, Jeremy Yallop (University of Cambridge), Jeremie Dimino, Mark Shinwell (Jane Street), Louis Gesbert (OCamlPro)*

12:30 - 14:00 **Lunch**

14:00 - 14:55 **Language**

14:00 A Proposal for Non-Intrusive Namespaces in OCaml — *Pierre Couderc, Fabrice Le Fessant (INRIA), Benjamin Canou, Pierre Chambart (OCamlPro)*

14:25 Improving Type Error Messages in OCaml — *Arthur Charguéraud (INRIA & Université Paris Sud)*

14:40 Github Pull Requests for OCaml development: a field report — *Gabriel Scherer (INRIA)*

14:55 - 15:10 **Break**

15:10 - 16:00 **Joint Poster Session (with ML Family workshop)**

Irminsule; a branch-consistent distributed library database — *Thomas Gazagnaire, Amir Chaudhry, Anil Madhavapeddy, David Sheets, Gregory Tsipenyuk, Jon Crowcroft (University of Cambridge), Richard Mortier (University of Nottingham), David Scott (Citrix System)*

A Case for Multi-Switch Constraints in OPAM — *Fabrice Le Fessant (INRIA)*

LibreS3: design, challenges, and steps toward reusable libraries — *Edwin Török (Skylable Ltd.)*

Nullable Type Inference (from ML Family) — *Michel Mauny, Benoit Vaugon (ENSTA-ParisTech)*

16:00 - 16:30 **Tea break**

16:30 - 17:50 **Applications**

16:30 Coq of OCaml — *Guillaume Claret (Université Paris Diderot)*

16:55 High Performance Client-Side Web Programming with SPOC and Js of ocaml — *Mathias Bourgoin, Emmmanuel Chailloux (Université Pierre et Marie Curie)*

17:10 Using Preferences to Tame your Package Manager — *Roberto Di Cosmo, Pietro Abate, Stefano Zacchiroli (Université Paris Diderot), Fabrice Le Fessant (INRIA), Louis Gesbert (OCamlPro)*

17:35 Simple, efficient, sound-and-complete combinator parsing for all context-free grammars, using an oracle — *Tom Ridge (University of Leicester)*

17:50 - 18:00 **Closing**

Erlang Workshop

09:00 – 09:10 **Welcome**

09:10 – 10:00 **Invited Keynote** Chair: Laura M. Castro

09:10 Functional Programming and the Megacore Era
Kevin Hammond (University of St Andrews)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Concurrency and Paralelism**

10:30 More Scalable Ordered Set for ETS Using Adaptation
Konstantinos Sagonas, Kjell Winblad (Uppsala University)

10:55 Discovering Parallel Pattern Candidates in Erlang
Melinda Tóth, István Bozó (Eotvos Lorand University), Viktória Fördös (ELTE-Soft Ltd.), Zoltán Horváth, Dániel Horpácsi, Judit Köszegi, Tamás Kozsik (Eotvos Lorand University), Chris Brown, Adam Barwell, Kevin Hammond (University of St Andrews)

11:20 – 11:40 **Break**

11:40 – 12:30 **Testing**

11:40 On Shrinking Randomly Generated Load Tests
Thomas Arts (Quviq AB)

12:05 Jsongen: a QuickCheck Based Library for Testing JSON Web Services
Clara Benac Earle, Lars-Ake Fredlund, Angel Herranz, Julio Mariño (Universidad Politécnica de Madrid)

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Distribution**

14:00 Investigating the Scalability Limits of Distributed Erlang
Amir Ghaffari (Glasgow University)

14:25 Derflow: Distributed deterministic dataflow programming for Erlang
Manuel Bravo, Zhongmiao Li, Peter Van Roy (Université catholique de Louvain), Christopher Meiklejohn (Basho Technologies, Inc.)

14:50 – 15:10 **Break**

15:10 – 15:40 **Runtime**

15:10 BEAMJIT – A Just-in-Time Compiling Runtime for Erlang
Frej Drejhammar, Lars Rasmusson (SICS AB)

15:40 – 16:00 **Lightning talks**

15:40 Synapse: automatic behaviour inference and implementation comparison
Pablo Lamela Seijas (University of Kent), Ramsay Taylor, Kirill Bogdanov (University of Sheffield), Simon Thompson (University of Kent), John Derrick (University of Sheffield)

15:50 Faulterl: precise fault injection for Erlang NIFs and linked-in drivers
Scott Fritchie (Basho Japan KK)

16:00 – 16:30 **Tea break**

16:30 – 16:50 **Invited Talk** Chair: Hans Svensson

16:30 Erlang Latest News
Kenneth Lundin (Ericsson AB)

16:50 – 17:00 **Farewell**

CUFP Tutorials, Day 2

09:00 – 12:30	**Morning Tutorials**	**Room**
T7	Introduction to OCaml *Leo White, Jeremy Yallop (University of Cambridge)*	R26
T8	Programming in Rust *Felix Klock, Lars Bergstrom (Mozilla)*	R24+25
12:30 – 13:30	**Lunch**	
13:30 – 17:00	**Afternoon Tutorials**	**Room**
T11	Batteries Included: Generative Programming with Scala and LMS *Tiark Rompf (Oracle Labs & EPFL), Nada Amin (EPFL)*	R26
T12	Introduction to testing with QuickCheck *John Hughes (Chalmers & Quviq)*	R24+25

Commercial Users of Functional Programming, Talks

09:00 – 10:00 **Opening remarks and keynote**

09:05 Making Money From FP
Joe Armstrong (Ericsson and Royal Institute of Technology in Stockholm)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **In situ**

10:30 Functional Programming at Verizon OnCue
Timothy Perrett (Verizon)

10:55 Adopting Functional Programming with OCaml at Bloomberg LP
Maxime Ransan (Bloomberg LP)

11:20 – 11:40 **Break**

11:40 – 12:30 **Distributed systems**

11:40 MBrace: large-scale programming in F#
Eirik Tsarpalis (Nessos)

12:05 Probabilistic Synchronization of State Between Independent Nodes
Erlend Hamberg

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Data and knowledge**

14:00 Towards "annex", a Fact Based Dependency System
Mark Hibberd (NICTA / Ambiata)

14:25 Building data and time-series analytics tools for F#
Tomas Petricek, Howard Mansell

14:50 – 15:10 **Break**

15:10 – 16:00 **Functional programming in space!**

15:10 Haskell in the Misson Control Domain
Michael Oswald

15:35 Haskell tools for satellite operations
Björn Buckwalter (Verizon)

16:00 – 16:30 **Tea break**

16:30 – 17:50 **Potpourri**

16:30 F# For Fun and Games
Anthony Brown

16:50 Some usages of functional programming for FO and quants
Renaud Bechade

17:10 Reactive I/O with Scala, Akka, and Play
Kenneth Owens (Comcast)

17:30 If your server is a function, is your company a library?
Andrew Cowie

Haskell Implementors Workshop

09:00 – 09:15 **Haskell Implementors' Workshop 2014**

09:00 Welcome to HIW 2014
Jost Berthold, Geoffrey Mainland

09:15 – 10:00 **Haskell in a different flavour**

09:15 CLaSH: Compiling circuit descriptions
Christiaan Baaij (University of Twente)

09:40 The Past, Present and Future of the Programmer-friendly Helium Compiler (short talk)
Jurriaan Hage (Universiteit Utrecht), Bastiaan Heeren (Open University NL)

10:00 – 10:30 **Coffee break**

10:30 – 11:20 **Memory / runtime management**

10:30 GUMSMP: a multilevel parallel Haskell implementation
Malak Aljabri (University of Glasgow), Hans-Wolfgang Loidl (Heriot-Watt University), Phil Trinder (University of Glasgow)

10:55 Managing a Haskell heap in Javascript
Luite Stegeman

11:20 – 11:40 **Break**

11:40 – 12:30 **GHC**

11:40 GHC status update
Simon Peyton-Jones (Microsoft Research)

12:05 GHC's developer tools ecosystem (contributing to GHC)
Joachim Breitner (Karlsruhe Institute of Technology)

12:30 – 14:00 **Lunch**

14:00 – 14:45 **Distributed Haskell**

14:00 The implementation of the HdpH DSLs: Details and Difficulties
Patrick Maier (University of Glasgow), Robert Stewart (Heriot-Watt University), Phil Trinder (University of Glasgow)

14:25 A GHC language extension for static values (short talk)
Mathieu Boespflug, Facundo Domínguez (Tweag I/O)

14:45 – 15:00 **Lightning talks I**

15:00 – 15:10 **Break**

15:10 – 16:00 **Advanced types**

15:10 Dependent Haskell
Richard Eisenberg (University of Pennsylvania)

15:35 Partial Type Signatures
Thomas Winant, Dominique Devriese, Frank Piessens (KU Leuven), Tom Schrijvers (Ghent University)

16:00 – 16:30 **Tea break**

16:30 – 17:10 **Haskell modules**

16:30 Extending Cabal with Plugins, Preprocessors and Multi-target Compilers (short talk)
Tibor Bremer (Universiteit Utrecht)

16:50 Implementing Backpack in GHC (short talk)
Edward Yang (Stanford University)

17:10 – 18:00 **Lightning talks II**

Workshop on Functional Art, Music, Modeling and Design

09:00 – 09:10 **Welcome**

09:10 – 10:00 **Session 1** Chair: Alex McLean

09:10 LiveCodeLab 2.0 and its language LiveCodeLang
Davide Della Casa, Guy John (LiveCodeLab)

09:40 Scripthica: a web environment for collective algorithmic composition
Gabriel Sanchez (New York University)

10:00 – 10:30 **Break**

10:30 – 11:20 **Session 2** Chair: David Duke

10:30 Functional Generation of Harmony and Melody
José Pedro Magalhães (Department of Computer Science, University of Oxford), Hendrik Vincent Koops (Department of Information and Computing Sciences, Utrecht University)

11:00 Using Haskell as DSL for controlling immersive media experiences
Henrik Bäärnhielm (Integral Systems Engineering), Mikael Vejdemo-Johansson (KTH Royal Institute of Technology), Daniel Sundström (Integral Systems Engineering.)

11:20 – 11:40 **Break**

11:40 – 12:30 **Session 3** Chair: Paul Hudak

11:40 Exploring melody space in a live context using declarative functional programming.
Thomas Kristensen (uSwitch Limited)

12:10 Music Suite: A Family of Musical Representations
Hans Höglund

12:30 – 14:00 **Lunch**

14:00 – 14:50 **Session 4** Chair: David Janin

14:00 Temporal semantics for a live coding language
Sam Aaron, Dominic Orchard, Alan Blackwell (Computer Laboratory, University of Cambridge)

14:30 Sound and Soundness – Practical Total Functional Data-Flow Programming
Baltasar Trancón Y Widemann (TU Ilmenau), Markus Lepper (semantics GmbH)

14:50 – 15:10 **Break**

15:10 – 16:00 **Session 5** Chair: Sam Aaron

15:10 Tiled Polymorphic Temporal Media
Paul Hudak (Yale University), David Janin (LaBRI, Université de Bordeaux.)

15:40 LittleBits Synth Kit as a livecoded, functional, monadic, physically-embodied, domain specific programming language
James Noble, Timothy Jones (Victoria University of Wellington)

16:00 – 16:30 **Break**

16:30 – 17:20 **Session 6** Chair: Henrik Nilsson

16:30 Making programming languages to dance to: Live Coding with Tidal
Alex McLean (ICSRiM, University of Leeds.)

17:00 Patterning: Repetitive and recursive pattern generation using Clojure and Quil
Phil Jones (Alchemy Islands.)

17:20 – 17:30 **Closing words**

Social events

Monday Sep 1, 17:45 – 19:00. Welcome reception

Immediately after the scientific program on Monday, the City of Gothenburg will host a welcome reception in the coffee area just outside the ICFP lecture room H1+H2.

Tuesday Sep 2, 20:00 – 23:00 . Banquet

The conference banquet takes place in Eriksbergshallen, on the north bank of the river. The building used to house the mechanical workshops of Eriksbergsvarvet, one of the main shipyards in Gothenburg in the 19th and 20th centuries.

Buses will leave the conference centre at 19:00 and 19:30 to take participants to the banquet venue. Buses also take participants back to the city centre/conference venue after the banquet, at 22:00 and 22:45.

Thursday Sep 4, 18:30 – 20:30. Industrial reception

The industrial reception, supported by our platinum and gold sponsors, takes place at the Museum of World Culture, a 200 m walk from the conference venue. Time table:

18:00 Industrial sponsors arrive to setup their tables.
18:30 Reception starts; wine and tapas served; tables manned by sponsors.
19:00 Talks start. Ends with exhibition briefly presented by guide.
19:30 Talks end. People can leave for dinner at this point if they have plans.
19:30 Exhibition opens (more wine and mingling for those who prefer that).
20:30. End of reception.