Overview of ICFP 2015

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ICFP 2015
Program

Sessions:

- Compilers
- Types
- Foundations
- Cost analysis
- Theorem provers
- Parallelism
- Information flow
- Domain-specific languages
- Data structures
- Contracts
- Type checking

ICFP 2015

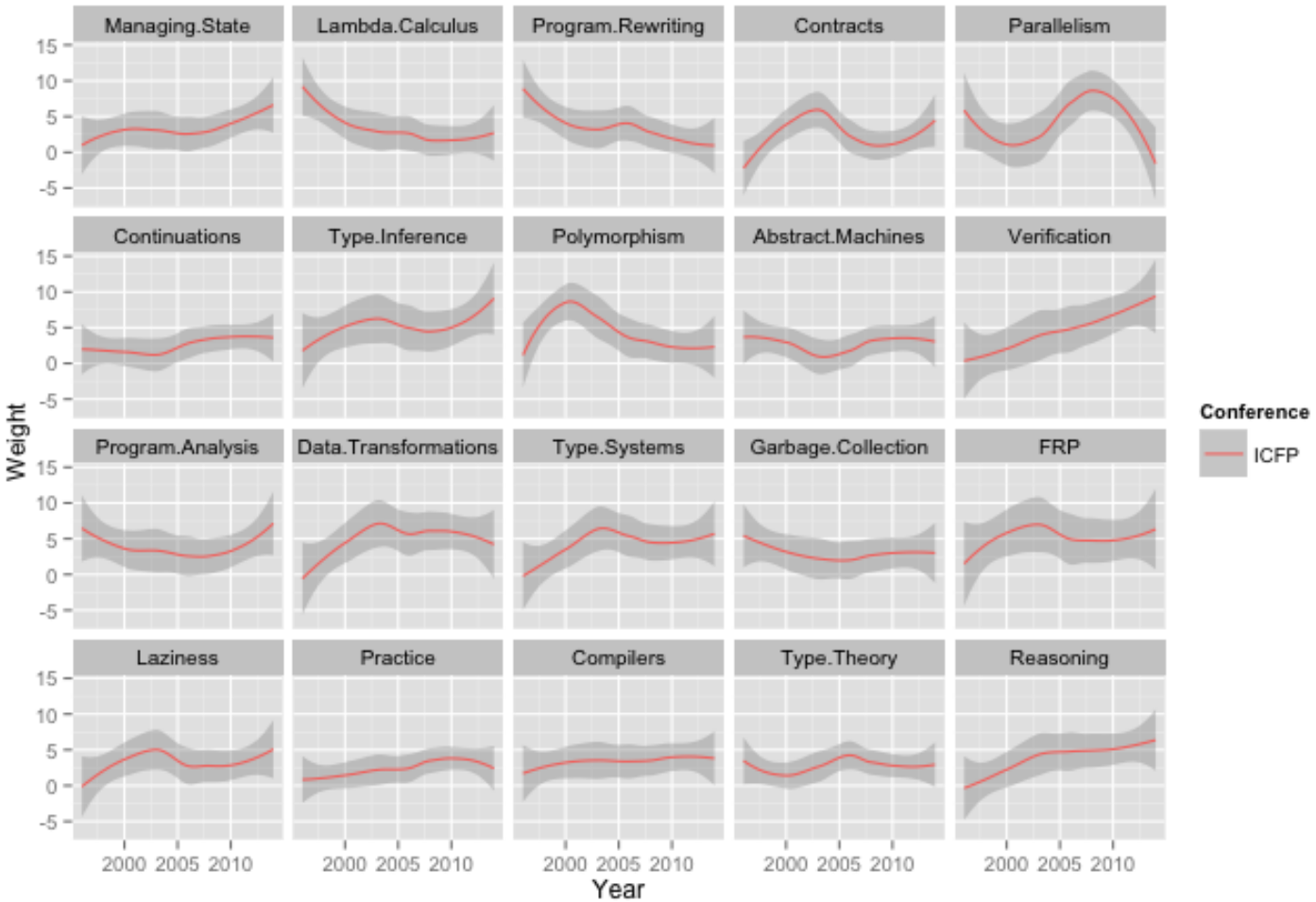
program

Affiliated events:

- Haskell Implementors Workshop
- Ally Skills Tutorial
- Programming Languages Mentoring Workshop
- Workshop on Functional High-Performance Computing
- Haskell Symposium (2 Days)
- Commercial Users of Functional Programming (3 Days)
- ML Family Workshop
- OCaml Workshop
- Scheme and Functional Programming Workshop
- Functional Art, Music, Modeling and Design

ICFP2015

Trends [1]



[1] *Tracking the flow of ideas through the programming languages literature*, Michael Greenberg, Kathleen Fisher, and David Walker

Topics
DSL's

Domain
Specific
Language

"is a computer language specialized to a particular application domain." [2]

[2] Wikipedia contributors, Domain-specific language , October 20, 2015.

Topics
DSL's

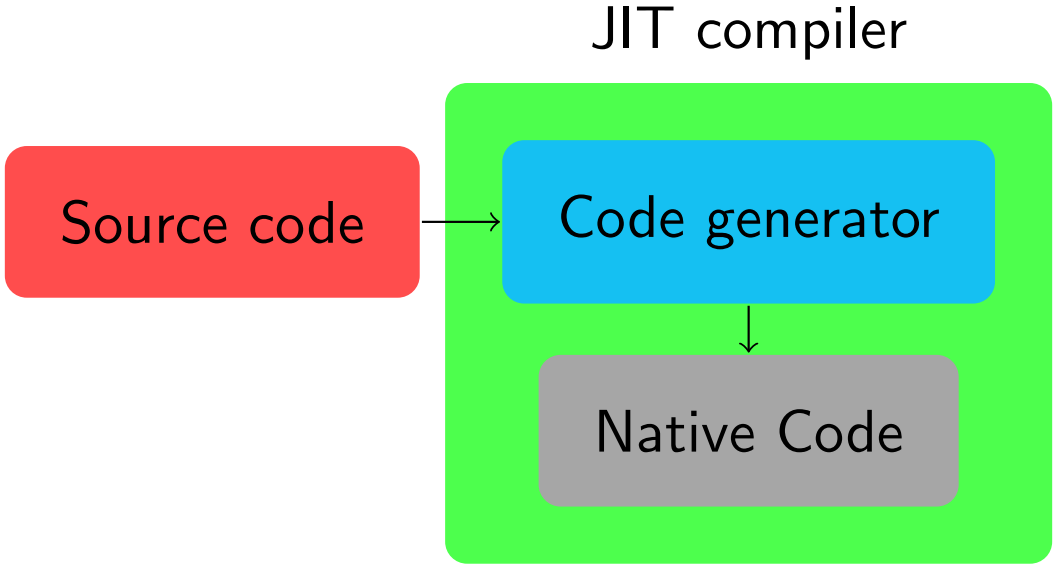
SQL:

```
SELECT id, student
FROM students
WHERE grade > 3.0 ;
```

LaTeX:

```
\begin{description}
\item[D]\hspace{-0.18cm}omain
\item[S]\hspace{-0.18cm}pecific
\item[L]\hspace{-0.18cm}anguage
\end{description}
```

Just In Time compiler



Topics
Refinement types

"Refinement types allow us to decorate types with logical predicates (think boolean-valued Haskell expressions) which constrain the set of values described by the type." [3]

```
{-@ divide :: Int -> { v: Int | v != 0 } -> Int @-}
divide     :: Int -> Int -> Int
divide n 0 = error' "divide by zero"
divide n d = n `div` d
```

[3] Ranjit Jhala, LiquidHaskell , October 20, 2015.

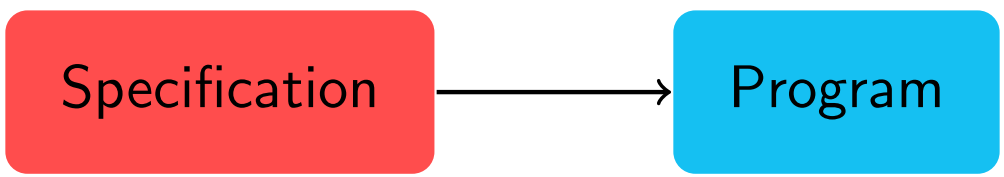
> *"The contract system guards one part of a program from another."* [4]

```
#lang racket

(provide (contract-out
          [deposit (-> number? any)]
          [balance (-> number?)]))

(define amount 0)
(define (deposit a) (set! amount (+ amount a)))
(define (balance) amount)
```

[4] racket-lang contributors, Contracts, October 20, 2015.

Topics
Program synthesis

"Program synthesis is the task of automatically discovering an executable piece of code given user intent expressed using various forms of constraints such as input-output examples, demonstrations, natural language, etc." [5]



[5] Sumit Gulwani, Program Synthesis, October 20, 2015.

Highlights

- *Program Synthesis: Opportunities for the next Decade*
  Ras Bodik, University of Washington
- *Pycket: A Tracing JIT For a Functional Language*
  Spenser Bauman, Indiana University
- *Bounded Refinement Types*
  Niki Vazou, UC San Diego

Highlights

- *Learning Refinement Types*
  He Zhu, Purdue University
- *An Optimizing Compiler for a Purely Functional Web Application Language*
  Adam Chlipala, MIT CSAIL
- *1ML - Core and modules united (F-ing first-class modules)*
  Andreas Rossberg, Google

Highlights

- *Algebras and Coalgebras in the Light Affine Lambda Calculus* Marco Gaboardi, University of Dundee
- *Elaborating Evaluation Order Polymorphism* Joshua Dunfield, University of British Columbia
- *Hygienic Resugaring of Compositional Desugaring* Justin Pombrio, Brown University