

From Data Types to Session Types: A Basis for Concurrency and Distribution

Glasgow Overview

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The Glasgow Team

Simon Gay *Principal Investigator*

Dimitris Kouzapas *post-doc* *started on 1st August*

Ornela Dardha *post-doc* *started on 6th January*

Two vacancies for PhD students. *1st October or earlier*

MSc project student *Spring / Summer*

Vacancy for a post-doc for approx. 18 months from 1st May, as DK will return to Imperial for a one-year fellowship.

Glasgow Project Involvement

P1: Industrial Case Studies

initially with Amazon, later with other partners

P2: Inter-language Interoperability via Session Types

with Imperial and partners; integrating Scribble with our work in P4

P4: Session Types for Mainstream Programming Languages

leader; with Imperial; initially working with session types for Java

P5: Session Types for Web Applications

with Edinburgh, Amazon, Cognizant

P6: Environments, Modelling and Empirical Studies

with Edinburgh and partners, later

P7: Foundations of Session Types

with Edinburgh and Imperial

Wider Collaboration

COST Action IC1201: Behavioural Types for Reliable Large-Scale Software Systems (BETTY) www.behavioural-types.eu

- A European research network, funded for 4 years from October 2012
- SG is Chair
- 22 countries, approx. 100 researchers (including ABCD people)
- Topics include session types, contracts, typestate, other forms of behavioural type, security, applications...
- Open workshops (BEAT @ POPL 2013, BEAT 2 @ SEFM 2013, BEAT 2014 @ CONCUR)
- Short-Term Scientific Missions (visits between institutions)
- Summer Schools in 2014 and 2016

Glasgow Team Activities (1)

- We have begun discussions with Andrew Birkett (Amazon) about case studies based on Amazon Web Services. (WP1.1)
- DK has begun work on implementing an extension of Java with typestate specifications, as a basis for integrating session types and typestate.
- OD will join DK working on Java and typestate. (WP4.1)
- DK presented a paper at the CONCUR conference, jointly with Nobuko Yoshida, based on his PhD work.
- DK gave a talk at the BEAT 2 workshop, about joint work with Anna Phillipou (University of Cyprus).

Glasgow Team Activities (2)

- SG gave a talk at the BEAT 2 workshop, about linear types in programming languages.
- Ramūnas Gutkovas (Uppsala University) visited Glasgow in November, to work on session types and broadcast communication (WP4.3) (paper submitted to the PLACES workshop).
- Anna Phillipou visited Glasgow in December, to work on types for privacy. (pre-P7?)
- Giovanni Bernardi (Trinity College Dublin) will visit Glasgow next week, to work on semantics of session types. (P7)

Glasgow Team Activities (3): WP4.1

- Integrating session types and tpestate specifications in Java.
- Based on theoretical work by SG, Vasco Vasconcelos, António Ravara and Nils Gesbert.
- Previous prototype implementation by Zua Caldeira, a PhD student of Vasco's.
- “Modular Session Types for Distributed Object-Oriented Programming” POPL 2010.
- The aim is to develop a front-end typechecker as an extension of Java, integrate with the SJ (Session Java) system developed by Raymond Hu at Imperial, and use it as a platform for further theoretical and practical work on session types in programming languages.