



# Archibald Samuel Elliott

Computer Science PhD Student: Programming Languages

## Research Interests

I work in Programming Languages. In particular, I am interested in working on Compilers, including those that use Program Synthesis techniques or Domain-Specific Languages.

## Education

2015 → Current

**PhD Computer Science**, *University of Washington*, Seattle, WA.

My focus is on Program Synthesis. I'm a member of the Programming Languages and Software Engineering (PLSE) and SAMPA Groups, advised by Ras Bodik and Mark Oskin.

### Graduate Courses

- Principles of Programming Languages (Tatlock)
- Computer Architecture (Oskin)
- Computer-Aided Reasoning for Software (Torlack)
- Robotics (Fox)
- Compilers (Bodik)

2011 → 2015

**BSc (Hons) Computer Science**, *University of St Andrews*, St Andrews, UK, First Class Honours.

With Year Abroad (2013–2014) at the *University of Virginia*, Charlottesville, VA.

Prizes: 2014–2015: Dean's List; 2012–2013: Dean's List & CS2004 Medal; 2011–2012: CS1002 Medal & O'Reilly Academic Prize.

### Bachelors Dissertation

**A Concurrency System for Idris & Erlang**, Supervised by Dr Edwin Brady.

I explored how Idris, a dependently-typed language, could be used to reason about the behaviour of concurrent Erlang programs. This included writing an Idris to Erlang compiler, and designing libraries for modelling Erlang's concurrency using dependent types.

2009

**IB Diploma**, 34 (Equivalent to  $4 \times A$  at A-level).

2007

**GCSEs & IGCSEs**,  $4 \times A^*$ ,  $4 \times A$ ,  $1 \times B$ ,  $2 \times C$ .

## Experience

Jan 2017 →

**Research Intern**, *Microsoft Research*, Redmond, WA.

April 2017

I worked on the Checked C project, under David Tarditi. Checked C is a language extension that aims to make C safer, starting with adding bounds-checked pointer types. My work was to help extend Clang to support Checked C, including adding compiler infrastructure to insert run-time bounds checks.

July 2011 →

**Freelance Software Engineer**, UK.

July 2015

I freelanced as a distributed systems engineer. Previous clients include *The Wine Trade Ltd* (Cambridge, UK), and *Hypernumbers* (Linlithgow, UK).

June 2013 →

**Junior Software Engineer**, *Basho Technologies*, Remote (London, UK & Cambridge, MA).

Sept 2014

I worked in the data types team, designing and building *Convergent Replicated Data Types* (CRDTs) for *Riak*, a distributed database. This work included writing papers and collaborating with academics in Portugal.

June 2012 →

**Research Intern**, *University of St Andrews*, St Andrews, UK.

Aug 2012

I worked in the Functional Programming group, working on a parallel Erlang system for the *ParaPhrase* EU research project.

April 2010 →

**Junior Software Developer**, *55degrees Ltd*, Glasgow, UK.

May 2011

I built websites and other systems for a variety of both public and private sector clients.

Seattle, WA – USA

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Known as: Sam • Citizenship: British with F-1 Visa for USA

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## Programming Languages

Functional: **Erlang, Racket**, Haskell, Idris, Coq  
Systems: Rust, C, C++

Object-Oriented: Ruby, Python, Java

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## Publications

- ICFP SRC '15 **Erlang/OTP Meets Dependent Types**, Archibald Samuel Elliott, In the Student Research Competition at the International Conference of Functional Programming, Vancouver, September 2015.
- PaPEC '14 **Riak DT Map: A Composable, Convergent Replicated Dictionary**, Russell Brown, Sean Cribbs, Christopher Meiklejohn and Sam Elliott, In the Proceedings of the First Workshop on Principles and Practice of Eventual Consistency, Amsterdam, April 2014.
- IJPP 42/4 **Cost-Directed Refactoring for Parallel Erlang Programs**, Christopher Brown, Marco Danelutto, Kevin Hammond, Peter Kilpatrick and Archibald Elliott, In the International Journal of Parallel Programming Volume 42, Issue 4, August 2014.

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## Conference Talks

### Academic

- 2012 **Skel: A Streaming Process-based Skeleton Library for Erlang**, *IFL 2012*, Oxford, UK.  
I presented a draft paper about my work on the *ParaPhrase* project completed at the University of St Andrews.

### Industrial

- 2013 **CRDTs: An Update (or maybe just a PUT)**, *RICON West 2013*, San Francisco, CA.  
I presented the work of the data types team that was in the upcoming *Riak 2.0* release, at Basho's Distributed Systems conference.
- 2012 **A Tour Through Ruby's Dusty Corners**, *SRCFringe 2012*, Edinburgh, UK.

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## Awards

- 2015 **Lockheed Martin Award for Software Engineering**, *ScotSoft 2015*, Edinburgh, UK.  
I received this award for my Bachelors Dissertation, *A Concurrency System for Idris & Erlang*, as part of The Young Software Engineer of the Year Awards. These awards are a Scotland-wide competition for the best undergraduate software projects from students studying Computer Science or Software Engineering.

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## Teaching

- Autumn 2016 **CSE 401: Introduction to Compiler Construction**, *Teaching Assistant*, for Prof Ras Bodik.

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## Other Interests

- Sailing I am a keen sailor, and can sail both yachts and dinghies. I am crew on *Bravo Zulu*, a boat based in Seattle, and we regularly race in Puget Sound. In 2016 we were ranked 10th in the local area by *48° North*, the local sailing magazine. I hold the *RYA Day Skipper* qualification. I used to be a member of the *University of St Andrews Sailing Club* and the *University of Virginia Sailing Club*.
- Quark and Byte I used to present a weekly science news show called *Quark and Byte* on *St Andrews STAR Radio*. On the show we discussed recent scientific developments, and interviewed scientists about their work.
- Theatre At University I was involved with technical theatre and technical event management. I was on the *Ents Crew* in the St Andrews Students' Association for 3 years, managing over 50 events and helping with many more. I was an Assistant Stage Manager for *The Forgetting River*, produced by the University of Virginia's Drama Department in 2014. I have also worked at 6 music festivals between 2009 and 2012, primarily as a site electrician.

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