

Liam O'Connor-Davis

SUMMARY	<p>I'm a computer scientist specialising in programming languages. I have skills in formal verification and theorem proving (e.g Agda and Isabelle/HOL) as well as functional programming, particularly Haskell. I also enjoy programming in languages such as Scala and ML. I have research experience with formal semantics of programming languages, particularly in the encoding of logic into language type systems, and the use of this as a proof method via the Curry Howard correspondence. In the past I have developed a great deal of experience in web development, including experience at Google in the development of a new product (Google Wave). I follow closely development of new standards for the Web. I also have some skill at concurrent and distributed programming, and I'm aware of various approaches to concurrency abstraction and concurrent data structures. I am able to structure constructive proofs of properties on concurrent programs using standard methods.</p>	
SPECIALTIES	<p>Functional Programming; Formal Verification; Type Theory; Logic; Logic Programming; Programming Languages; Compilers; Web Development; Category Theory; Discrete Mathematics; Theorem Proving; Parallelism; Concurrency; Distributed Computing.</p>	
COMPUTING SKILLS	<p><i>Programming Languages:</i> Haskell, Agda, Coq, Isabelle, Standard ML, Scheme, C, OCaml, C++, Java, Scala, Clojure, Ruby, Python, Erlang, Mercury. <i>Operating Systems:</i> Mac OS X, Linux, BSD</p>	
EDUCATION	<p><i>PhD (currently studying)</i> Computer Science University of New South Wales. In 2014 I was also affiliated with NICTA. <i>Thesis topic:</i> "Language-aided Systems Verification" Focusing on the use of linear types and other PL research to make verifying low-level software systems for functional correctness cheaper and easier.</p> <p><i>Bachelor of Science (Hons. 1st Cl.)</i>, Computer Science University of New South Wales. Completed several courses with high distinction and earned four awards:</p> <ul style="list-style-type: none">• Macquarie Undergraduate Performance Award (1st Year)• CSE Undergraduate Performance Award (1st Year), 3rd Place• CSE Undergraduate Performance Award (3rd Year), 3rd Place• CSE Undergraduate Performance Award (4th Year), 3rd Place <p>I had an honours thesis result that was second among all graduands, at 93.4.</p> <p><i>Honours thesis:</i> "Formalising GHC's Type System", a dependently typed formalisation of the type system of a Haskell compiler. <i>Special Project:</i> "PhracJS - A Lazy, Purely Functional Language for Browsers", an investigation into the suitability of purely functional programming for the web browser via compilation to JavaScript. Involved the implementation of a small compiler. <i>Special Project:</i> "Gentzen - A Beginner's Theorem Prover", a carefully designed theorem prover intended to aid in the teaching of introductory courses for formal semantics of programming languages.</p>	
EXPERIENCE	<p><i>Research Engineer</i> Software Systems Research Group, NICTA</p> <ul style="list-style-type: none">• Working on Haskell DSLs for file system specification for the Bilby verified file systems project.	<p>January 2013 - January 2014</p>

- *Publication:* “File Systems Deserve Verification Tool!”
Gabriele Keller, Toby Murray, Sidney Amani, Liam O’Connor
Zilin Chen, Leonid Ryzhyk, Gerwin Klein, Gernot Heiser
Workshop on Programming Languages and Operating Systems
November 2013

Research Assistant March 2011 - December 2012
Software Systems Research Group, NICTA

- Contributions to the l4.verify operating system verification project.

Casual Teaching Academic January 2009 - Present
School of Computer Science and Engineering, UNSW

- Teaching tutorials and lectures in courses ranging from introductory C and Java programming to formal semantics of programming languages, high-assurance programming, concurrency and verification.

Software Engineer November 2009 - February 2010
Google

- Internship developing features for Google Wave.

Tech Lead January 2008 - March 2011
Mudo Media

- Developing a web and facebook application for travellers to share information with each other. Developed using Haskell web frameworks (Yesod) and a RESTful API.

Director May 2005 - May 2010
Innove Pty. Ltd.

- Chief Technical Officer, Director and Manager.