

# Stephen Kell

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**Date of birth:** 1<sup>st</sup> March 1984  
**Nationality:** British

## Education

- 2006–10 Computer Laboratory, University of Cambridge**  
PhD in Systems Research Group, supervised by David Greaves. Thesis entitled “Black-box composition of mismatched software components”.
- 2002–05 Christ’s College, University of Cambridge**  
BA Hons., Computer Science, class I (all Parts). Included an extended individual project and dissertation “A general-purpose synthetic filesystem”.

## Research interests

Generally interested in all aspects of programming infrastructure, languages & tools. Specific interests:

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|---|--|
| <b>Language implementation</b> integrating “native” and “managed” environments; debuggability and observability.    | <b>Programming system design</b> abstractions for cross-language programming; features for specification and verification.       |
| <b>OS–PL integration</b> whole-program and whole-system linking, loading, debugging and instrumentation mechanisms. | <b>Software composition</b> general approaches to modular programming, interface description, adapter generation/synthesis, etc. |

## Selected publications

- S. Kell. *Dynamically diagnosing type errors in unsafe code*. OOPSLA 2016.
- S. Kell, D.P. Mulligan and P. Sewell. *The missing link: explaining ELF static linking, semantically*. OOPSLA 2016.
- Y. Zheng, S. Kell, L. Bulej, H. Sun, W. Binder. *Comprehensive multi-platform dynamic program analysis for Java and Android*. IEEE Software 33(4), 2016.
- S. Kell. *Towards a dynamic object model within Unix processes*. Onward! 2015.
- S. Kell. *In search of types*. Onward! 2014.
- D. Ansaloni, S. Kell, L. Bulej, Y. Zheng, W. Binder, P. Tuma. *Enabling modularity and re-use in dynamic program analysis tools for the Java Virtual Machine*. ECOOP 2013.
- S. Kell. *Component adaptation and assembly using interface relations*. OOPSLA 2010.
- S. Kell. *A survey of practical software adaptation techniques*. JUCS 14(13), July 2008.

## Professional activities

- Programme committees: SPLASH workshops 2016, PEPM 2016, Onward! Essays ’15; PPPJ ’13; EuroSys 2012 shadow PC; various workshops 2012–present.
- External reviewer: TACO (2015–), ASE journal (2014), SAC 2012, ESOP 2010, EuroSys 2009
- Organisational roles: co-organiser of Salon des Refusés workshop (2017); publicity chair, Software Composition 2013
- Invited speaker at over a dozen universities and research institutions across Europe and North America.

## Research experience

- 2013– University of Cambridge**  
Research Associate (Senior, 2017–): “Rigorous engineering for mainstream systems”
- Dynamic type- and bounds-checking in unsafe languages, with strong usability and performance properties and relation to C formal semantics.
  - Accurate formal specification of Unix linking and loading services, mechanisable with application to verified toolchains, runtimes etc..

*Stephen Kell CV continued...*

- 2013 Oracle (Labs) America**  
Research Assistant
- Research and development into debugging infrastructure and object code interoperation for high-performance embeddable virtual machine.
- 2012–13 Faculty of Informatics, University of Lugano**  
Postdoctoral Assistant
- Instrumentation-based dynamic analysis infrastructure, including compositionality and isolation of analyses on the Java Virtual Machine.
- 2011–12 Department of Computer Science, University of Oxford**  
Postdoctoral Research Assistant
- Practical verification and bug-finding techniques, including mixed static/dynamic analysis using symbolic execution.
- 2007 Fraser Research, Princeton, New Jersey**  
Senior Technical Associate
- Clean-slate internetworking research, including network emulation, compatibility middlebox design and capability-based security.
- 2005–06 Computer Laboratory, University of Cambridge**  
Research Assistant
- Design and implementation of security features for the Xen hypervisor.

## Teaching experience

- 2005– Various roles (Cambridge, Oxford)**
- Small group teaching: extensive experience supervising/tutoring undergraduate courses in operating systems, programming, networks, etc..
  - Dissertation supervisor of six completed undergraduate dissertations
  - Practical demonstrator/assessor of Bachelor's (programming in Java and ML; numerical computing); and Master's (internetworking) courses.

## Development experience

- 2009–14 Self-employed consultancy for Ellexus Ltd, Cambridge**
- Primary developer of back-end tracing engine in Cambridge start-up company's developer tools product.
  - Continued consulting role as company's scientific adviser.
- summer 2005 ARM Ltd, Cambridge**  
Software Engineer
- Embedded debugger development.
- 2001–04 Opal Telecom Ltd, Irlam, Manchester**  
(various spells) Software Engineer
- Development of customer-facing web authentication system (summer 2004), web service messaging middleware (summer 2003) and resource monitoring systems for live telephony switch (2001–2).

## Skills

**Software development** Experienced software developer, familiar with wide variety of languages and platforms. Special system-level expertise in C and Unix. Expert in Unix linking and debugging mechanisms.

**Speaking and communicating** Experienced speaker and communicator in both research and developer spheres (e.g. Strange Loop conference 2014; papers and blog discussed on Hacker News, Lambda the Ultimate, etc.)

## Referees

Names and contact details are available on request.