

Dr. Edd Barrett

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An experienced, confident and open-minded programmer and computer scientist.

Education

2014 PHD IN COMPUTER SCIENCE FROM UNIVERSITY OF KENT

My thesis “Range Analysis of Binaries with Decision Procedures” investigates the applicability of Boolean satisfiability and linear programming to the static program analysis of machine code.

2009 BSC HONS. COMPUTING FROM BOURNEMOUTH UNIVERSITY

First class with honours. Dissertation titled “3c: A JIT Compiler with LLVM” describes the implementation of a JIT for a dynamically typed object-oriented programming language using LLVM.

2002 A- AND AS-LEVELS FROM QUEEN MARY’S COLLEGE, BASINGTOSKE

Including Computing, Physics, Electronics and Mathematics.

Employment

2013– RESEARCH ASSOCIATE, KING’S COLLEGE LONDON

Research on: programming language composition (building VMs which can run programs written in a mix of languages, fast); reliable benchmarking methodology; and new dynamic compilation techniques.

2009–2013 PART TIME TEACHER AT UNIVERSITY OF KENT

Teaching C, UNIX, logic programming and Java at undergraduate and masters level.

2009–2013 OUTREACH PROJECT AT UNIVERSITY OF KENT

Teaching programming fundamentals to schools (age 13-16) using Lego robotics.

2007–2008 BOURNEMOUTH UNIVERSITY

Placement year as a part of undergraduate studies. UNIX systems administration (Solaris, Linux, OpenBSD) and in-house development.

2003–2005 TECTONICS LTD.

Maintenance and reimplementing of a legacy stock management system, programming industrial CNC routers for kitchen manufacturing, systems administration, IT support.

Skills

Programming Languages I am an experienced programmer. I am currently most fluent in Python, C, Java, Prolog, and – most recently – Rust. I have toyed with OCaml, C++, Lua, Ruby, PHP etc. I have also worked on JITted language implementations of Python, PHP and Prolog. I can learn new programming languages and paradigms on demand.

Software Engineering I believe that good software engineering processes can help to deliver better quality software. I use version control, write tests, file bugs, and take part in code reviews.

Computer Science Since 2009 I’ve worked in an academic environment, publishing papers on both theoretical and practical topics including: language composition, JIT compilation, benchmarking, abstract interpretation, optimisation problems, and propositional logic.

Systems Administration I have many years of experience with UNIX systems. I maintain my own person desktops, web and mail servers. Most of them run OpenBSD, but I also feel at home with Linux.

Academic Service/Organisation

I’ve served on the committees of several computer science workshops and journals, including: IC00LPS, DLS, Dyla, COMLAN and JOT. In 2018 I served on the organising committee of MoreVMs.

I co-organised Barcamp Canterbury 2012–2014, and each summer I volunteer at folk festivals.

Software Contributions

PyHyp A composed JITted VM capable of executing (fast) a mix of Python and PHP code. The system enables fine-grained language interoperability, allowing: cross-language scoping; passing objects between languages; cross-language exceptions etc. This work was published in ECOOP'16.

Krun A benchmarking harness designed to reduce the impact of confounding variables upon benchmark measurements. This tool was used in work that was published in OOPSLA'17.

Unipycation A composed JITted VM capable of executing (fast) a mix of Python and Prolog code. I also implemented the same composition upon the JVM and C for performance evaluation. This work made appearances in COMLAN and VMIL'13.

OpenBSD project Developer for an open-source UNIX distribution since October 2009. I work mostly on the ports tree, which involves patching and packaging third party software. I've worked a little in the kernel and on a few user-space programs.

Dgen/SDL project Implemented a debugger for an open-source games console emulator written in C/C++. This was just for fun.

Selected Publications

- E. Barrett, C. F. Bolz-Tereick, R. Killick, S. Mount and L. Tratt. Virtual Machine Warmup Blows Hot and Cold. *Object-Oriented Programming, Systems, Languages and Applications (OOPSLA)*, October 2017.
- E. Barrett, C. F. Bolz, L. Diekmann, L. Tratt. Fine-grained Language Composition: A Case Study. *European Conference on Object-Oriented Programming (ECOOP)*, July 2016.
- E. Barrett, C. F. Bolz, L. Tratt. Approaches to Interpreter Composition. *Computer Languages, Systems and Structures (COMLAN)*, December 2015.
- E. Barrett, C. F. Bolz, L. Tratt. Unipycation: A Case Study in Cross-language Tracing. *Virtual Machines and Intermediate Languages (VMIL)*, October 2013.
- E. Barrett. Range Analysis of Binaries with Decision Procedures. *PhD thesis*, March 2014.
- E. Barrett, A. M. King. Range Analysis of Binaries with Minimal Effort. *Formal Methods in Critical Systems (FMICS)*, August 2012.

Hobbies and Interests

I am an electronics hobbyist, and enjoy repairing old 80's technology (my office is full of micro-computers and audio kit which I have repaired). I enjoy reading sci-fi novels, and sometimes make beer. In the summer I like to go walking and camping. I go rock climbing once a week, and exercise at the gym 2-3 times a week.

References

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