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Education & Awards

- 2007, Ph.D. Computing Science: Newcastle University. Thesis title: “*A Domain Specific Language for Dynamic Interest Management within Virtual Environments*”. Supervisor: Professor Paul Watson, external examiner: Professor Chris Greenhalgh.
- 2001, Software Engineering BSc with First Class Honours, Newcastle University. Graduated with prizes for academic excellence and best dissertation
- 2000, European ERASMUS distributed computing summer scholarship, UPV (Universidad Politécnica de Valencia), Spain.
- Gold Duke of Edinburgh Award

Research Focus & Objectives

I see software primarily as a form of communication. One that is not just limited to a conversation between a programmer and the computer but between many participants all of whom have an interest in understanding parts of the software system. My research is based around this notion which, when made an explicit focus, I call communicative programming. Related research topics include live programming, programming language aesthetics, domain specific languages and language oriented programming.

Having already applied these techniques to great effect for the communication of interests within virtual environments, transport research tool specifications and the description of the pertinent entities and relationships of a large pharmaceutical company's ERP system, I am currently exploring their potential impact for the creation of musical devices with a high capacity for improvisation.

I am inspired to improve our ability to communicate, helping people gain a greater freedom to express themselves in order to collaborate and share their ideas.

Employment History

Research Associate, Raspberry Pi Team, Cambridge University: Nov 2012 -

Working with Dr Rob Mullins to create new schemes of work for teaching Computer Science in schools. Created the Sonic Pi application, a live coding environment for children focussed on the creation of sounds through programming. Sonic Pi has been successfully trialled in schools at KS3 level with the focus now on fostering broader adoption across the UK education sector.

Research Associate, DTG, Cambridge University: Nov 2011 - Nov 2012

Worked with Dr Andy Rice in the Digital Technology Group (DTG) on the Open Room Maps (ORM) system. ORM is a tool enabling building itinerary data to be obtained and kept up-to-date through crowd sourcing techniques.

Postdoc Researcher, Improcess, Rainbow Group, Cambridge University: Sept 2010 - Nov 2011

Formed and directed a research project, Improcess, under the supervision of Dr Alan Blackwell, involving collaborators in the Cambridge Computer Laboratory and Music Faculty, the Anglia Ruskin Digital Performance Lab and Microsoft Research Cambridge. This research explored the combination of both tactile and highly abstract linguistic user interfaces with state-of-the-art real-time synthesis software in order to build new forms of musical device with a high capacity for improvisation.

Lead Architect, Innovation Factory, Amsterdam Jan 2008 - Aug 2010

Architected and developed a wide variety of sophisticated web applications and deployed them both into standard hosting environments and also large secure internal enterprise virtual machine clusters. Initiated and championed a variety of Agile methodologies within the programming team and project leaders. Also designed, implemented and deployed a sophisticated online ERP mirroring system which included client-readable domain specific languages as a core component for the critical aspects that required both absolute precision and a high tolerance for change. Now that this system has processed 40 million Euro worth of sales, this core technology is now being deployed by the company in other products internationally.

Technical Research Consultant, School of Transport, Newcastle University 2006-2007

Built a decision support tool to aid the creation of new transport services. Used agile development practices and the Ruby on Rails framework. Represented business logic with a client-readable domain specific language.

Researcher & Developer, The Amazing Group, Newcastle 2005-2006

Worked as a researcher, designer and developer. Built conceptual designs and working prototypes for a variety of projects. Initiated testing, version control and ticketing techniques for in-house development. Communicated directly with development teams, management and clients.

Technical Research Consultant, School of Transport, Newcastle University 2003-2004

Worked with a team of developers on a European funded project which combined a variety of SOAP-based web-services using a database-driven web application. The resulting product matched available jobs with available transport routes for a given person and location.

Open Source Software

I am a firm believer of the importance of an open and free approach to software development. I therefore work and collaborate on a number of open source projects which continue to see wide adoption. For example:

Overtone (<http://overtone.github.io>) is a sophisticated programmable audio environment designed to explore new musical ideas from synthesis and sampling to instrument building, live-coding and collaborative jamming. It combines the powerful SuperCollider audio engine, with Clojure, a state-of-the-art lisp, to create an intoxicating interactive sonic experience.

Quil (<http://github.com/quil/quil>) is a Clojure wrapper around the Processing visual programming environment. Quil improves over Processing in that it facilitates a live coding workflow. It is therefore possible to redefine all or parts of a running visual sketch live without restarting the system.

Emacs Live (<http://overtone.github.io/emacs-live>) is a Emacs Live is a carefully curated distribution for the Emacs editor. The Emacs Live philosophy is to consider the process of programming as a performance. As a direct consequence it places a strong emphasis on live feedback, visual cues and creating a clean uncluttered flow-enhancing distraction-free environment.

Speaking & Teaching

I enjoy speaking at, helping organise and attending conferences. I am attracted by the concentration of interesting, interested and enthusiastic people and the energy that produces.

I have been invited to present my ideas on themes such as *Aesthetic & Communicative Programming* at local events as well as highly prestigious and international conferences including QCon and JAOO. In addition, I have enjoyed giving tutorials at these major events which have enabled me to share my passion and knowledge in a teaching environment. Highlights of these presentations and tutorials are as follows:

- **EmacsConf**, London, UK, 2013 - Talk and Overtone Performance “*Emacs Live - Hacking as Performance*”
- **Lambda Next Clojure workshop**, Berlin, Germany, 2013 - Delivered a 3 day Clojure workshop to professional software developers
- **Clojure Exchange**, London, UK, 2012 - Talk - “*Hacking Overtone*”
- **FP Days**, Cambridge, UK, 2012 - Talk and Clojure Workshop
- **Tampere goes Agile**, Tampere, Finland, 2012 - Talk and Overtone Performance
- **Arnolfini**, Bristol, UK, 2012 - Overtone Performance
- **Clojure West**, Portland, Oregon, USA, 2012 - Talk “*Cyberpunk for the Overtone generation*”
- **Wolfson College**, Cambridge 2012 - Presentation “*Notes on the Synthesis of Music*”
- **Culture Labs**, University of Newcastle 2012 - Presentation “*Notes on the Synthesis of Music*”
- **Clojure/conj**, Raleigh NC USA, 2011 - Talk “*Making Music with Overtone*”
- **Functional Programming Day**, Cambridge 2011 - Talk “*Making Music Functionally with Overtone*”
- **London Clojure User Group**, London 2011 - Seminar “*Hacking Music with Clojure*”
- **Darwin College**, Cambridge 2011 - Presentation “*Notes on the Synthesis of Musical Form*”
- **Cambridge Computer Labs**, Cambridge, 2011 - Seminar “*A principled approach to developing new languages for live coding*”
- **Goto CPH**, Copenhagen, 2011 - Talk “*Learn as you Play*” & Dojo “*Programming with the Stars*”
- **RubyFoo**, London, 2009 - Keynote Presentation “*Notes on the Synthesis of Ruby Form*”
- **JAOO**, Århus, 2009 - Tutorials on “*Advanced Ruby*” & “*Principles of Aesthetic Programming*”
- **QCon**, London, 2009 - Tutorials on “*Advanced Ruby*” & “*Principles of Aesthetic Programming*”
- **Amsterdam Ruby BarCamp**, Amsterdam, 2009 - Presentation “*Notes on the Synthesis of Form*”
- **JAOO Geek Night**, Copenhagen and Århus, 2009 - Seminar “*Aesthetic Programming in a Communicative Age*”
- **JAOO**, Århus, 2008 - Presentation “*Aesthetic Programming*”
- **RubyFools**, Copenhagen and Oslo, 2008 - Presentation “*Communicative Programming with Ruby*”
- **RubyEnRails**, Amsterdam, 2008 - Presentation “*Language Aesthetics*”
- **RailsConf Europe**, Berlin, 2007 - Presentation “*PhD on Rails*”

Selected Publications & Acknowledgements

Samuel Aaron and Jenny Judge. *Snapshots: new possibilities for social digital music-making arising from the storage of history*. International Computer Music Conference (ICMC): Ljubljana, Slovenia; September 2012

Alistair G. Stead, Alan F. Blackwell and Samuel Aaron. *Graphic Score Grammars for End-Users*. In Proceedings of New Instruments for Musical Expression 2012.

Samuel Aaron, Alan F. Blackwell, Richard Hoadley, and Tim Regan. *A principled approach to developing new languages for live coding*. In Proceedings of New Instruments for Musical Expression 2011, pages 381–386, 2011.

Contributor and Technical Reviewer for *The Rails Way*, Addison-Wesley Professional Ruby Series, Technical Reviewer for *Beginning Google Maps Applications with Rails and Ajax*, Apress, acknowledged in *The Rails Cookbook*, O'Reilly and *The Joy of Clojure*, Manning.