

# Dr William Stevens

## Curriculum Vitae

### General Information

Name: William Stevens  
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### Education and Qualifications

2004 - 2009 Open University, Department of Physics and Astronomy  
PhD: Self-Replication, Construction and Computation

1995 - 1998 University of Kent at Canterbury (UKC)  
BSc in Computer Science - First class with honours.

Core subjects:

Mathematics

Maths for Computing, Logic, Formal Specification.

Programming

Software Engineering, Functional Programming, Object Oriented Programming, Compiling Techniques.

Low level

Electronics, Assembly Language Programming, Operating Systems, Parallel Computing, Real Time Systems.

High level

Database Systems, Networks, Expert Systems.

In my third year, I took part in a project to write a Helpdesk system.

I received awards for highest exam performance in my second and third years.

### Clubs and Activities

2007-8 President of Wallingford Rotaract Club.  
2003-8 Occasional volunteering work for Emmaus Oxford.  
2002-9 Treasurer for St Mary Magdalene church, Crowmarsh Gifford.

I am a member of the Institute of Physics, the British Interplanetary Society and the Historical Metallurgy Society

## Employment History

7/94 - 9/97  
(18 months  
in total) Defence Research Agency, Dorset and Farnborough.  
Assistant Science Officer and Vacation Student  
Various projects including finite element analysis, programming a machine to determine some of the temperature dependent properties of polymers, and writing S-Plus programs related to terrain reference navigation.

8/98 – 6/00 B S Instruments Ltd, Littlehampton.  
Software Engineer.  
Part of a development team for the Instromet Model 2000 Flow Computer.  
Involved in design and implementation of both hardware and embedded software.  
Also responsible for maintaining some of the company's existing products.

6/00 – 4/02 Celoxica Ltd. (formerly Embedded Solutions Ltd), Abingdon.  
Software Engineer.  
Worked on tools supporting the Handel-C hardware compiler and DK1 Design Suite – a system that allows digital hardware descriptions to be written in a high level language.

(During this interval I spent time gaining classroom experience as a volunteer teaching assistant in preparation for a PGCE course)

9/02 – 2/03 PGCE Student at Oxford University Department for Educational Studies. I undertook this course in order to become a secondary school mathematics teacher. During the course I discovered that I could not meet the demands of school teaching, so I withdrew from the course.

(During this interval I was unemployed, and spent the time working on what is now my PhD research project)

9/03 – 4/06 Wallingford School, Oxfordshire.  
Part-time ICT Technician.  
Responsible for helping to support the school's ICT infrastructure. Windows 2000 setup and admin. C++ development, MySQL/Perl development. Linux admin.  
I took this job in order to support myself during a part-time PhD course.

During this period I also ran adult education courses in beginners computer skills and website design using HTML.

4/06 – 6/11 Department of Psychiatry, University of Oxford  
Senior Software Engineer  
Responsible for managing a team of 3 developers to produce clinical trial data entry, remote data capture and trial management software.  
C++, .NET, SQL Server, MySQL, PHP

7/11 - Now Unconventional Computing Group, University of the West of England, Bristol  
Postdoctoral Research Associate

## Publications and Interests

This page lists my publications. The following page lists some of the projects that I have completed in my working life and in my spare time.

*Computing with Planar Toppling Domino Arrangements*, Stevens W. M. (2011)  
Unconventional Computation (2011) - Lecture Notes in Computer Science, Springer Berlin / Heidelberg, DOI:10.1007/978-3-642-21341-0\_25, pages 224-233

*A Self-Replicating Programmable Constructor in a Kinematic Simulation Environment*, Stevens, W. M. (2011). Robotica Vol 29, Special Issue on Robotic Self-X Systems, pages 153-176

*Adapting Gosper's Hashlife Algorithm for Kinematic Environments*, Stevens, W.M. (2010)  
Proceedings of the 2010 Workshop on Complex Systems Modelling and Simulation (Luniver Press, Frome, UK), pages 75-91.

*The longitudinal course of bipolar disorder as revealed through weekly text-messaging*, Bopp, J.M, Miklowitz, D. J., Goodwin, G. M., Stevens, W., Rendell, J. M., & Geddes, J. R. (2010). Bipolar Disorders Vol 12, pages 327-334.

*Lithium plus valproate combination therapy versus monotherapy for relapse prevention in bipolar I disorder (BALANCE): a randomised open-label trial*. The BALANCE investigators and collaborators. Lancet 2010; 375: 385-395

*Parts closure in a kinematic self-replicating programmable constructor*, Stevens, W.M. (2009)  
Journal of Artificial Life and Robotics, DOI 10.1007/s10015-008-0618-1

*A Kinematic Turing Machine*, Stevens, W.M. (2009)  
International Journal of Unconventional Computing, 2009, Vol 5, Issue 2, pages 145-163.

*Logic circuits in a system of repelling particles*, Stevens, W.M. (2008)  
International Journal of Unconventional Computing, 2008, Vol 4, Issue 1, pages 61-77.

*Simulating Self-Replicating Machines*, Stevens, W.M. (2007)  
Journal of Intelligent and Robotic Systems, DOI 10.1007/s10846-007-9132-2

*Nodes: An Environment for Simulating Self-Replicating Machines*, Stevens, W.M. (2004)  
Proceedings of the Ninth International Conference on the Simulation and Synthesis of Living Systems (MIT Press), pages 39-44.

Activity	Years	Description	Technology
Clinical trial management system (Work)	2007-2009	Manages contacts, data entry, medication supply, communications.	Psychiatry Databases
Clinical trial tools (Work)	2007	Minimisation algorithm, blind medication pack number allocation	Clinical trials methodology
Prototype activity monitor (Work)	2006	Wearable activity logger based on accelerometer measurements.	Microchip PIC, IrDA protocol
Text message mood rating system (Work)	2006	Collects mood ratings for depression by SMS. Used in Oxford bipolar clinic. Won the national NHS Live award in 2008.	AT commands Mood rating
Automated software installation system (Work)	2005	System to help deploy legacy software across Wallingford School campus.	Databases Job efficiency
Self-Replication, Computation and Construction PhD	2004-Now	Simulation of kinematic self-replicating programmable constructor. 7 peer-reviewed papers	Theory of computing Conferences Publication
Planet finder and sky-map for Palm OS	2003	Astronomy software to help locate stars and planets.	Astronomy Palm SDK
BASIC interpreter for Palm OS	2003	BASIC language interpreter	Palm SDK
Quantum chemistry system	2002	Ab initio calculation of electron configuration of organic molecules.	Biochemistry Physics, Open GL
Logic simulation integration platform (Work)	2001	A hub for connecting simulators at different levels of abstraction.	C++, Handel-C, Modelsim, MATLAB
Hardware Compiler inspired by Handel-C and others	2001	A compiler for a high level HDL based on C. Written using LISP.	LISP, FPGAs
Virtual logic analyser (Work)	2000	A plugin as part of the DK1 Development System, Celoxica Ltd	C++, MFC, Handel-C
Reconfigurable gas flow computer (Work)	1998-2000	B S Instruments Ltd, Significant contributions towards hardware and software development.	Coldfire, PIC, RTOS, Teamwork
Artificial evolution simulation	1998	I developed the 'Nodes' environment for this project, later used for PhD.	C++, Allegro library
Self-replicating machine in a 2D discrete space kinematic simulation environment.	1997	Developed the 'CBlocks' environment. This project later became part of my PhD work, and was published in 2007.	C, Kinematic simulation
Portable Tetris game	1995	Based on 8051 microcontroller and a dot matrix LCD display.	8051 micro. Electronics
Finite Element Analysis software	1995	Dynamic simulation. FE mesh laid out using a Logo-like language.	Borland Turbo Pascal
8051 Microcontroller Development Kit	1995-1999	EPROM programmer, assembler, C-compiler, real-time operating system.	Compiler writing, RTOS
Games and simulations for ZX Spectrum and Atari ST	1987-1994	Classic arcade games, physics and artificial life simulations	Z80, STOS BASIC, C