

# Academic CV

## Simeon Bamford

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### Work:

Modelling Complex Systems Group,  
Edificio 1, Piano B,  
Istituto Superiore di Sanità,  
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### Home:

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00183 Roma, Italy.  
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## Education

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- 2005 - 2008      PhD, Neuroinformatics, University of Edinburgh.
- 2004 - 2005      MSc by Research, Neuroinformatics (Distinction), Edinburgh University.  
Taught element included: Neuroscience Research Methods, Neural  
Computation, Bioinformatics, Neuromorphic VLSI, Neuroinformatics  
Research.
- 1995              RSA/CTEFLA, GEOS Language Centre, Hove.
- 1992 - 1995      BA hons, Artificial Intelligence (First Class), Sussex University.

## Employment (Academic and Other)

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- 2009 Apr - present    Research Associate, Laboratory for Synthetic Perceptive, Emotive and  
Cognitive Systems, Pomeu Fabra University, Barcelona; seconded to  
Modelling of Complex Systems group at l'Istituto Superiore di Sanità in  
Rome; working on EU funded ReNaChip project. ([www.renachip.org](http://www.renachip.org))
- 2009 Jan-Mar        Research Associate, University of Edinburgh.
- 2008 (p/t)            Tutor for Neuromorphic VLSI MSc module, University of Edinburgh Doctoral  
Training Centre for Neuroinformatics.
- 2007 (p/t)            Website Developer, University of Edinburgh Doctoral Training Centre for  
Neuroinformatics. ([www.anc.ed.ac.uk/dtc](http://www.anc.ed.ac.uk/dtc))
- 2004                  Business Mentor for social entrepreneurs; freelance with London  
Development Agency.
- 1998 - 2004          Entrepreneur and Director, Cycle Training UK Ltd, London.  
([www.cycletraining.co.uk](http://www.cycletraining.co.uk))
- 1996-1998            Database Developer and Technical Manager, JHC, London.
- 1995-1996            English Teacher (EFL), (1) Greenwich School of English, Włocławek, Poland;  
(2) CESC, Framlingham, Suffolk.

## Research

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I find both the study of neural systems and the discipline of engineering them fascinating. The project I'm working on aims to create a chip which can be implanted in a brain to demonstrate that it can perform a simple learning task (classical conditioning) as well as the part of the brain (cerebellum) it is replacing. My role primarily involves converting computational models of cerebellar function into integrated electronic circuitry, as well as building circuitry for recording and

processing of neural signals.

My PhD was in the area of neuromorphic engineering. Specifically, I worked on: an alternative method for spike delivery within multi-chip neuromorphic systems for improved scalability; synaptic rewiring in VLSI; and the application of synaptic rewiring in modelling the development of topographic maps and receptive fields, for example in the early visual pathway. In my MSc I gained experience of patch-clamp recording from dissociated cells and in-vitro cultures, using novel integrated patch-clamp devices; I also gained silicon clean-room experience. I also briefly worked on a project to develop a field-programmable analogue array intended for neuromorphic applications.

In addition to my technical skills and expert knowledge in science and engineering, I have excellent written and spoken communication skills. My self-starting and hard working nature is demonstrated by the success of my previous entrepreneurial career.

## Peer-Reviewed Journal Articles

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- 2009 "Synaptic Rewiring for Topographic Map Formation and Receptive Field Development", Bamford SA, Murray AF, Willshaw DJ. *Neural Networks*, accepted. (<http://www.sim.me.uk/neural/NN.pdf>)
- 2009 "Large Developing Receptive Fields Using a Distributed and Locally Reprogrammable Address-Event Receiver", Bamford SA, Murray AF, Willshaw DJ. *IEEE Transactions on Neural Networks*, accepted. (<http://www.sim.me.uk/neural/TNN.pdf>)

## Peer-Reviewed Conference Papers

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- 2008 "Large Developing Axonal Arbors Using a Distributed and Locally-Reprogrammable Address-Event Receiver", Bamford SA, Murray AF, Willshaw DJ, *IEEE International Joint Conference on Neural Networks (IJCNN)* pp.1464-1471. (<http://www.sim.me.uk/neural/2008IJCNN.pdf>)
- 2008 "Synaptic Rewiring for Topographic Map Formation", Bamford SA, Murray AF, Willshaw DJ, *International Conference on Artificial Neural Networks (ICANN)* pp. 218-227. (<http://www.sim.me.uk/neural/2008ICANN.pdf>)

## Other Publications

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- 2009 "Synaptic Rewiring in Neuromorphic VLSI for Topographic Map Formation" PhD Thesis, University of Edinburgh. (<http://www.sim.me.uk/neural/thesis.pdf>)

## Invited Talks

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- 19<sup>th</sup> Dec 2008 "Synaptic Rewiring in Neuromorphic VLSI for Topographic Map Formation", Modelling of Complex Systems group, Istituto Superiore di Sanità.
- 10<sup>th</sup> June 2008 "Synaptic Rewiring in Neuromorphic VLSI for Topographic Map Formation", Electronic and Computer Engineering Dept., Hong Kong University of Science and Technology.
- 9<sup>th</sup> April 2008 "Synaptic Rewiring in Neuromorphic VLSI for Topographic Map Formation", Robotics, Brain and Cognitive Sciences Dept., Italian Institute of Technology.

## Conferences and Workshops

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2009	I attended the Barcelona Cognition, Brain and Technology Summer School.
2008	International Joint Conference on Neural Networks, Hong Kong.
2008	International Conference on Artificial Neural Networks, Prague.
2007	I attended the Neuromorphic Engineering Workshop, Telluride, CO; (I was named "Best New Neuromorph").

## Professional Memberships

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I am a member of the IEEE.

## Technical Skills

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Electronics design	Cadence, Spice, Target 3001, Xilinx ISE - VHDL
Data capture	Molecular Devices: Axoscope and Clampex
Programming	Matlab, Java, C++, Delphi - Object Pascal, Pop-11, Prolog, Visual Basic
Databases	MySQL, Access, IBM AS400 - RPG
Web development	PHP, HTML, CSS, Javascript, Joomla, Dreamweaver
OS and apps	Linux, Windows, Latex, Open Office, MS Office, Photoshop

## Other Interesting Achievements

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2007	Winner of Edinburgh University Informatics Science Writing Competition. <a href="http://www.inf.ed.ac.uk/events/news/cswriting07.html">http://www.inf.ed.ac.uk/events/news/cswriting07.html</a>
2006	Co-organised "enSight": science-art collaborations website and gallery. <a href="http://www.sim.me.uk/ensight">http://www.sim.me.uk/ensight</a>
1994	Winner of Sussex University COGS Robotics Challenge. <a href="http://cogslib.informatics.scitech.susx.ac.uk/csr_abs.php?type=csrp&amp;num=354">http://cogslib.informatics.scitech.susx.ac.uk/csr_abs.php?type=csrp&amp;num=354</a>

## References

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### Academic:

Alan Murray (PhD Supervisor)  
Institute of Integrated Micro and Nano Systems,  
The University of Edinburgh,  
2.074 Faraday, Kings Buildings, Mayfield Road,  
Edinburgh EH9 3JL, United Kingdom.  
[A.F.Murray@ed.ac.uk](mailto:A.F.Murray@ed.ac.uk)

David Willshaw (PhD Supervisor)  
Institute for Adaptive and Neural Computation,  
The University of Edinburgh,  
10 Crichton Street,  
Edinburgh EH8 9AB, United Kingdom.  
[willshaw@inf.ed.ac.uk](mailto:willshaw@inf.ed.ac.uk)

### Employment:

James Bednar (Employer for recent  
part-time web development work)  
Neuroinformatics Doctoral Training Centre,  
The University of Edinburgh,  
10 Crichton Street,  
Edinburgh, EH8 9AB, United Kingdom.  
[jbednar@inf.ed.ac.uk](mailto:jbednar@inf.ed.ac.uk)

David Dansky (Staff manager for  
previous company)  
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