

James McDermott

CONTACT INFORMATION

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SKILLS

- Research Interests: evolutionary computation, genetic algorithms, representations, music, 3D design
- Languages: English (excellent technical communication skills), Irish and Italian (competent)
- Programming: Python, Java, C, C++, Unix shell, Tcl and expect, R
- Operating Systems: Linux, Mac OS X

EDUCATION

University College Dublin

September 2008 - present

Post-doctoral researcher with the Natural Computing Research & Applications group in UCD's Complex and Adaptive Systems Lab. Research into evolutionary computation, including grammatical representations, 3D design, and evolutionary music. Funded by IRCSET Empower (competitive scholarship).

University of Limerick

March, 2004 - April 2008

Ph.D. in Music Technology, Centre for Computational Musicology and Computer Music, Dept. Computer Science and Information Systems.

- Thesis: "Evolutionary computation for the control of sound synthesis"
- Supervisors: Niall J. L. Griffith (CCMCM, University of Limerick) and Michael O'Neill (NCRA, University College Dublin)
- External examiner: Leonardo Vanneschi (Milano-Bicocca)
- Funding: IRCSET (competitive scholarship)

I used theoretical and experimental methods to study the application of genetic algorithms and other machine learning techniques to the control of sound synthesis. I studied automatic evolution through simulations and statistics, and interactive evolution through usability studies with custom GUIs. I used digital signal processing methods to synthesize and analyse sound.

University of Limerick

September, 2003 - March, 2004

Enrolled on taught M.Sc. in Music Technology; transferred to research in March 2004.

National University of Ireland, Galway

September 1996 - June 2000

B.Sc. in Mathematics with Computing, 1st class honours (85%).

- Final-year project: "Young Tableaux, with Algorithms". A study of a combinatorial concept with applications to group theory. Algorithms were implemented in the GAP language.

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- ACADEMIC EXPERIENCE *Program Committee Member* **November, 2005 - present**
Reviewing submissions to the GECCO, CEC, EvoMUSART and (previously) DAFx conferences.
- University College Dublin**
Supervisor **February 2009 - present**
Supervising Master's student in computational linguistics and undergraduate summer intern in evolutionary methods for gestural control of music. Mentoring of PhD students.
- University of Limerick**
Instructor **March, 2004 - May, 2007**
Labs and tutorials in (aural and visual) cognitive psychology, C++ and Prolog.
- National University of Ireland, Galway**
Instructor **September, 1997 - May, 2000**
Teaching and demonstrating C, FORTRAN and Maple.
- PROFESSIONAL EXPERIENCE **Hewlett-Packard** (formerly **Compaq**), Ballybrit Industrial Estate, Galway, Ireland
Software Engineer **September, 2000–May, 2002**
- Worked on software for the AlphaServer SC supercomputer, achieving top 10 positions in the Top 500 supercomputer list. Customers included large governmental and scientific weapons and weather simulation installations in the USA, France and Japan.
- I had individual responsibility for install and system management software for the DS20 supercomputer. I worked as part of a small team using expect and Tcl in the automated parallel install and system management of large numbers of Tru64 Unix supercomputer nodes, and wrote network test software in C. I used CVS and PTR to manage source code and bug reports. I helped to manage small test clusters and wrote technical documentation.
- HONOURS AND AWARDS International Mathematical Contest in Modelling: Meritorious 1999, Honourable Mention 2000. Academic entrance scholarship to National University of Ireland, Galway, 1996. Finalist in GECCO Evolutionary Art competition, 2009.
- OTHER INTERESTS I contribute to the open-source music sequencer Aldrin (written in Python and C++).
- I play and write for electric and acoustic guitar, synthesizers and sequencers, voice, piano and drums. I have recorded several albums of my own and others' rock and electronic music using both home and professional studios. I read literary fiction, science fiction, and popular works in science, maths and linguistics.
- REFEREES **Dr. Michael O'Neill** *phone: +353 1 716 2906*
UCD CASL *email: m.oneill@ucd.ie*
Dublin 14, Ireland. *web: ncra.ucd.ie/members/oneillm.html*
- Prof. Ted Hurley** *phone: +353 91 750 422*
Dept. of Mathematics *email: ted.hurley@nuigalway.ie*
NUI Galway, Ireland. *web: www.maths.nuigalway.ie/staff/thurley.shtml*

- JOURNAL ARTICLES AND BOOK CHAPTERS O’Neill, McDermott, Swafford, Byrne, Hemberg, Shotton, McNally, Brabazon and Hemberg, “Evolutionary Design using Grammatical Evolution and Shape Grammars: Designing a Shelter”, *International Journal of Design Engineering*, in press.
- McDermott, O’Neill, and Griffith, “Interactive EC Control of Synthesized Timbre”, *Evolutionary Computation Journal*, in press.
- McDermott, Griffith and O’Neill, 2007, “Evolutionary Computation Applied to Sound Synthesis”. In Machado and Romero (eds.), *The Art of Artificial Evolution*, Springer.
- CONFERENCE PAPERS McDermott, 2009, “Tree Representations and the Usability of Interpolating Controllers” (i-HCI 2009).
- Byrne, O’Neill, Brabazon, and McDermott, 2009, “Structural and Nodal Mutation in Grammatical Evolution” (poster), GECCO 2009.
- O’Neill, Swafford, McDermott, Byrne, Brabazon, Shotton, McNally, and Hemberg, 2009, “Shape Grammars and Grammatical Evolution for Evolutionary Design”, GECCO 2009.
- Reddin, McDermott, O’Neill and Brabazon, 2009, “Elevated Pitch: Automated Grammatical Evolution of Short Compositions.” EvoMUSART 2009 (poster). In *Applications of Evolutionary Computing*, Springer.
- McDermott, Griffith and O’Neill, 2008, “New-Generation Methods in an Interpolating EC Synthesizer Interface.” EvoMUSART 2008. In *Applications of Evolutionary Computing*, Springer.
- McDermott, Griffith and O’Neill, 2007, “Evolutionary GUIs for Sound Synthesis”. EvoMUSART 2007. In *Applications of Evolutionary Computing*, Springer (Best Paper nomination).
- McDermott, Griffith and O’Neill, 2006, “Timbral, Perceptual, and Statistical Attributes for Synthesized Sound”. In *Proceedings of the 2006 International Computer Music Conference*, ICMA.
- McDermott, Griffith and O’Neill, 2005, “Toward User-driven Evolution of Sound Synthesis Parameters”. In *Applications of Evolutionary Computing*, Springer.