Curriculum Vitae: Geraint A. Wiggins

Date of completion: April 12, 2011

Record

Full name: Geraint Anthony Wiggins

Date of Birth: 15th July 1962

Place of Birth: Shoreham-by-Sea, West Sussex

Nationality: British

University Education and Degrees Awarded:
1981–84: BA (2.i, Mathematics and Computer Sciences), Corpus Christi College, Cambridge
1988: MA, Corpus Christi College, Cambridge
1991: PhD (Artificial Intelligence), University of Edinburgh
2007: PhD (Musical Composition), University of Edinburgh

Career since Graduation:
1987–1989: Computing Officer, Department of Artificial Intelligence, University of Edinburgh
1989–1995: Research Fellow, Department of Artificial Intelligence, University of Edinburgh
1995–1996: Freelance consultancy, including:
    Research Fellow (pt), Institute of Ecology and Resource Management, University of Edinburgh
    Consultant to Office of Science and Technology, Technology Foresight programme
    Scottish Arts Council Creative Artist's Bursary
1996–1999: Lecturer, Department of Artificial Intelligence, University of Edinburgh
1999–2003: Senior Lecturer, Department of Computing, City University, London
1999–2004: Honorary Fellow, College of Science and Engineering, University of Edinburgh
2001–2002: Senior Academic Adviser (Quality), School of Informatics, City University, London
2002–2004: Head of Department, Department of Computing, City University, London
2002–2004: Director, Centre for Computational Creativity, City University, London
2003–2004: Reader in Computational Creativity, City University, London
2004–present: Professor of Computational Creativity, Goldsmiths, University of London

Research Interests

Intelligent Music Systems and Music Cognition

From an early age, I have been interested in the use of computers for music, and was lucky enough to attend a school which was keen to support my interest. At A-level, however, I was forced by the then UK education system to make a choice between humanities and science, and opted to study computer science and mathematics at Cambridge as a first step to my intended career. I pursued this line with my first PhD, moving into a more music-related area – computational linguistics – though at that point in time it was not realistic to expect be funded to study music cognition for a PhD in AI. On completion of my AI PhD, I was accepted for the new PhD in Musical Composition at Edinburgh, which has allowed me to redress the balance of the two sides of my educational interests. The second PhD was awarded in November 2007.

I began work formally (though not on an official basis) on music-related AI in 1987, first publishing in 1989. At this stage, my research, in close collaboration with Drs. Alan Smaill and Mitch Harris, focussed on questions about knowledge representation for music, an area which we perceived as needing attention. At the same time, I was involved in setting up a series of student projects on music-related AI, the outcomes of several of which have since been published. While still at Edinburgh, I was able to develop the study

of Intelligent Music Systems and Music Cognition from a background activity, not supported by the then Department of Artificial Intelligence, to an officially recognised research group with myself as leading academic, supporting 5 PhD students and 1 research fellow.

At City University, from October 1999, I developed my group to include 10 full-time and 2 part-time members, at lecturer, fellowship and student level, plus various long- and short-term visitors. I continued to supervise former Edinburgh students, yielding a total of 6 PhD students under my guidance.

Since moving to Goldsmiths, in September 2004, the group has been developed further still, benefiting from a strategic partnership with the Centre for Digital Music at Queen Mary, University of London, which is expected to continue for the foreseeable future. We now include three academics, four contract research staff and six doctoral students.

My research interests, supported strongly by the others in my group, cover many areas of musical behaviour, ranging from "problem-solving" approaches to the simulation of musical skills, to simulations of the motivation behind the compositional process, performance behaviour, and systems for music education.

Recently, my interests have moved towards the cognitive science and psychology end of AI, focussing particularly on the study of musical creativity through computational modelling. This area is, of course, central to all of the above activities.

Computational Linguistics

My first PhD thesis focused on the computational analysis of noun phrase reference in English. The main contribution of the work was a calculus for the representation and manipulation of sentences containing underspecified set reference. The calculus was used in a quasi-parallel implementation of a proposed model of human linguistic reasoning in which the notion of "adaptability"—explicit ambiguity of representation—was paramount.

Since the completion of my first PhD, I have moved into a different field, though I still follow computational linguistics, particularly in the area of creative language, with a keen interest. This has led to on-going collaboration with Dr. Graeme Ritchie, University of Aberdeen, on creativity in language.

Computational Logic, Knowledge Representation and Automated Inference

My work in logic programming focussed on the generation by automatic means of logic programs, mostly cast in the new LP language, Gödel. The research applies techniques developed by Prof. Alan Bundy's research group for automated theorem proving to the synthesis of (more) efficient logic programs from naïve or non-executable specifications, by formal methods.

More recently, I worked on practical applications of logical knowledge representation – for computational ecology and chemical engineering. This has been backed up by industrial consultancy research in logical model representation and execution.

While my research is primarily in Intelligent Music Systems and Music Cognition, I still occasionally supervise in the logic programming area, and am occasionally active as a freelance systems analysis consultant and programmer.

Research-Related Activities

Research Grants Held, ⋆ as Principal Investigator

1998–1999:	⋆EPSRC, "An Automated Ear Training Tool for Trainee Musicians" (£52,703)
1999–2003:	⋆EPSRC, "Cognitively Pertinent Models and Tools for the Discovery and Analysis of Structural Similarity in Musical Data" (£204,801; collaborative with the University of Edinburgh)
1999–2000:	⋆EPSRC, "Startup of InterAction UK" (£16,913)
2000:	EPSRC GR/R25316, "Visting Fellowship: Pattern Matching in Musical Databases" (£17,520)
2003–2006:	⋆EPSRC, "Algorithms for Musical Pattern Recognition and Extraction" (£243,962; collaborative with King's College, London)
2003–2006:	⋆ARHB, "Electronic Corpus of Lute Music 2" (£294,370)
2003–2004:	⋆ACE/AHRB, "Electronic Music Performance Interfaces that Learn from their users" (£34,911)
2005–2006:	⋆EPSRC, "Visiting Fellowship for Dr Frans Wiering" (£18,051)
2005–2008:	⋆EPSRC, "Tools and Techniques for the Study of the Information Dynamics of Music" (£199,146; collaborative with Queen Mary, University of London)
2005:	⋆Andrew W. Mellon Foundation, "Scoping and Feasibility Study towards A Corpus of Encoded Scores of Classical Music" (£9,960; collaborative with School of Music, Indiana University, USA)
2006–2009:	⋆EPSRC, "Modelling Melodic Memory and the Perception of Musical Similarity" (£274,773)
2006–2008:	⋆Andrew W. Mellon Foundation, "MeTAMuSE: Methodologies and Technologies for Advanced Musical Score Encoding" (£137,000; collaborative with Indiana University, USA)
2010-2013:	⋆EPSRC "Information and Neural Dynamics of Music" (£757,554; collaborative with Queen Mary, University of London)
2010-2013:	EPSRC "SerenA: Chance Encounters in the Space of Ideas" (£1,538,295; collaborative with Dundee, Nottingham, Heriott-Watt, Lancaster, UCL)
2011:	British Academy "Cognitive models of musical pitch and tonality perception" (£2,000; collaborative with University of Southern California)

Patents Awarded

"SIA(M)ESE (UK)" – City University, London, D. Meredith, K. Lemström & G. Wiggins
"SIA(M)ESE II (UK)" – City University, London, D. Meredith, K. Lemström & G. Wiggins

Invited lectures and/or papers

2nd International Computer Music Festival, Brussels, 1989; 9th International Colloquium on Musical Informatics, Genova, 1991; Tutorial on Logic Program Synthesis, 11th International Conference on Logic Programming, 1994; "Nurturing Creativity" panel member, Creativity & Cognition 1999; Contemporary Music Review, special issue on Artificial Intelligence and Music, 1997, subsequently as a book, "Readings in Music and Artificial Intelligence", 2000; CybCon-2000 (annual conference of the Cybernetics Society), London; 1st International Joint Workshop on Computational Creativity, Madrid, Spain, 2004; Inaugural conference of School of Informatics, Indiana University, USA, 2004; Seminars: Bath; UK Atomic Energy Authority; King's, London (twice); Aberdeen; Imperial; Essex; Queen's, Belfast; Royal Academy of Music (3 times); Sussex (twice); Royal Holloway; East Anglia; MPI Leipzig; Aberdeen.

Research Supervision

Supervisor of more than 40 MSc students, and of 15 research students:

> Helen Lowe (completed, PhD, 1993, University of Edinburgh)
> Julian Richardson (completed, PhD, 1995, University of Edinburgh)
> Mandy Haggith (completed, PhD, 1996, University of Edinburgh)
> Somnuk Phon-Amnuiasuk (completed, PhD, 2002, University of Edinburgh)
> Marcio Brandão (completed, PhD, 2002, University of Edinburgh)
> Ben Curry (completed, PhD, 2003, University of Edinburgh)
> Luke Phillips (completed, MPhil, 2005, University of Edinburgh)
> Marcus Pearce (completed, PhD, 2005, City University, London)
> Miguel Ferrand (completed, PhD, 2006, University of Edinburgh)
> Tak-Shing Chan (completed, PhD, 2008, Goldsmiths, University of London)
> Oliver Bown (completed, PhD 2009, Goldsmiths, University of London)
> Alastair Craft (examined, Goldsmiths, University of London)
> Raymond Whorley (ongoing, Goldsmiths, University of London)
> Jamie Forth (ongoing, Goldsmiths, University of London)
> Alex McLean (ongoing, Goldsmiths, University of London)
> David Lewis (ongoing, Goldsmiths, University of London)
> Richard Lewis (ongoing, Goldsmiths, University of London)
> Chad Befus (ongoing, Goldsmiths, University of London)

Editorial and Peer review service

Journal Editorial   Managing Co-Editor, AISB Journal, 2001–2006.
Editor-in-Chief, AISB Journal 2006–2007.
Associate Editor (English), Musicae Scientiae, 2001–present.
Consulting Editor, Music Perception, 2008-present.
Editorial Board Member, Journal of New Music Research, 2011-present.

Funding agencies/Research Institutions   EPSRC reviewer, 1997–present; Swedish Research Council for Engineering Sciences, 1995; Austrian Fund for the Furthering of Scientific Research, 1998, 2004, 2006; Australian Research Council, 2005, 2006; EPSRC College of Peers, 2000–present; Radcliffe Institute, Harvard, 2007–8; AHRC College of Peers, 2009–present.

Journal Special Issue Editorial   Guest Co-editor, Journal of New Music Research, special issue on Artificial Intelligence and Music, 1996; Guest Editor, AISB Quarterly, 1999; Guest Co-editor, Computing in the Humanities, 2000.

Journal Peer Review   Journal of Logic Programming; Computer Music Journal; Artificial Intelligence Journal; Musicae Scientiae; Psychology of Music; Music Perception; Computing Surveys.

Programme Committee service   ICMC; LoPSTr; Creativity & Cognition; AISB Convention; Journées d'Informatique Musicale; 1st UK Soundscape Conference, 2001; Brazilian Conference on Computer Music, 2001; ICCBR'01 Workshop on Creative Systems, 2001; FLAIRS; ECAI; ISMIR; AdMIRe.

Book reviews   Journal of Artificial Intelligence, 1994; Knowledge Engineering Review, 1995; Musicae Scientiae, 1999, 2001, 2007/8; Literary and Linguistic Computing, 2008.

Conference and Symposium Organisation   Organiser and tutor on Logic Programming, AISB conference tutorial section, 1987; Organiser for ALP-UK conference, 1991; Organiser, program committee member, editor for World Conference on AI and Education Music Workshop, Edinburgh, UK, 1993; Organiser, program committee member and editor for International Congress on Music and AI, Edinburgh,

UK, 1995; General Chair, AISB'99 Convention, Edinburgh, UK, 1999; Organiser, programme chair and editor AISB'99 Symposium on AI and Musical Creativity, Edinburgh, UK, 1999; Co-organiser, programme co-chair and co-editor, AISB-00 Symposium on Creativity in AI and Cognitive Science, Birmingham, UK, 2000; Co-organiser, programme co-chair and co-editor, AISB'01 Symposium on AI and Creativity in Arts and Sciences, York, UK, 2001; Co-organiser, programme co-chair and co-editor, AISB'02 Symposium on AI and Creativity in Arts and Sciences, Imperial College, London, UK, 2002; Programme co-chair, organising committee member, International Conference on Music Information Retrieval, Queen Mary, University of London, UK, 2005; Co-organiser, programme co-chair and co-editor, 4th International Joint Workshop on Computational Creativity, Goldsmiths, University of London, UK, 2007; General Chair, 1st International Conference on Computational Creativity, Lisbon, Portugal, 2010.

Other

Organiser, ESPRIT Logic Program Synthesis and Transformation Human Capital and Mobility Fellowship Program, Edinburgh node, 1993–96; Edinburgh contact for European Network of Excellence in Computational Logic 1991–1996; Twice short-listed for Royal Society of Edinburgh research fellowships, 1994, 1995.

Teaching

I consider teaching, especially research supervision, an important part of my work. I aim to learn from my students, as well as teaching them, wherever possible. As a teacher, I aim to give an understanding of the commonalities in AI, as the field becomes more and more diversified; to produce students who are able to think usefully about the nature of AI; to understand learning itself by observing students learning processes; and to enjoy the experience of leading students to fuller understanding.

Lecturer in Artificial Intelligence, University of Edinburgh, 1996–1999

The former AI course at Edinburgh was divided into four year classes, AI1. . . AI4. When I took over my post in 1996, the AI2 course was completely redesigned, so I was working with a completely new syllabus. All the AI2 modules I taught had to be redesigned from the bottom up. I also updated the MSc Logic Programming module, making it one of the most advanced available in the UK.

AI1 module: Planning & Search
AI2 modules: Planning, Knowledge Based Systems, AI Programming Techniques
AI2 course organiser
AI3 module: Large Practical
MSc Logic Programming

Senior Lecturer in Computing, City University, London, 1999–2003
Reader in Computational Creativity, City University, London, 2003–2004

I lectured on Introductory Programming and Networks and Operating Systems for City University's BSc in Business Computing and MSc in Business Systems Analysis and Design. Both of these were new modules, which I developed.

Senior Academic Adviser (Quality), School of Informatics, City University, London, 2001–2004

I was responsible for academic quality in the School of Informatics, comprising the Departments of Computing and Information Science, and the Centres for Software Reliability, Human Computer Interface Design and Measurement and Information in Medicine. This post involved design and implementation of

academic quality assurance procedures across the School, and management of external quality audit submissions in the Computing area. I was also responsible for leading the conversion of our Undergraduate courses into the new CAPS system, for which I was awarded a City University Learning and Teaching award (2004) together with Dr. Andrew Tuson.

Head of Department, Department of Computing, City University, London, 2002–2004

I was Head of Department in Computing at City from 2002–2004, where my responsibilities included course development and improvement, staff development and general administration. On taking on this role, I restructured the Department into research groups and instituted a new, equitable administrative load model. I equalised teaching loads across the School, so as to allow Departmental staff research time. I have also rationalised the degree provision to allow modular restructuring while maintaining proper academic control over students' learning experience.

Professor of Computational Creativity, Department of Computing, Goldsmiths, University of London, 2004–present

I lead the Intelligent Sound and Music Systems group at Goldsmiths, which is the largest group of its kind in Europe. I have taught two 15-credit courses, Logic Programming (level 3) and Programming for Information Technology (level 1), though I have been bought out of the latter by research grants. I represented the Department of Computing on Goldsmiths' Academic Board; I served on the University of London's External System Learning and Teaching Quality and Information Systems Committees; and I chaired the Postgraduate Programme Monitoring Committee for the Department of Computing. Various other committee service is detailed below.

External Examining

Research Degrees

1999: Benjamin Reis, University of Cambridge
2003: Christian Spevak, University of Hertfordshire
2005: Declan Murphy, University of Copenhagen
2006: Kevin Jennings, Trinity College, Dublin
2006: Manuel Marques-Pita, University of Edinburgh
2006: Carola Boehm, University of Glasgow
2006: Gavin Wood, University of York
2006: Alastair Anderson, University of Glasgow
2007: Rainer Typke, University of Utrecht, The Netherlands
2007: Matthew Woolhouse, University of Cambridge
2007: Matthew Davies, Queen Mary, University of London
2008: Gavin Wood, University of York
2009: Katy Noland, Queen Mary, University of London
2009: Alberto Novello, Technical University of Eindhoven, The Netherlands
2010: Martin Rohrmeier, University of Cambridge
2010: Georg Bönn, University of Bath
2010: Peter van Kranenbrug, University of Utrecht, The Netherlands
2010: Philip Wheatland, University of Melbourne, Australia

Taught Degrees

2007–2010: Undergraduate programme, Department of Computer Science, Queen Mary, University of London

2007–2011: MSc in Creative Systems, University of Sussex

Public Media Contributions

BBC World *Click On Line* programme on computational creativity – contributing interviewee – broadcast internationally 10th November 2001 and repeated during the following week.

"What can computing bring to the study of creativity?" – Invited article for *i3* magazine, Spring 2002.

BBC Radio 4 "Creative Genius" – broadcast Autumn 2005, repeated Autumn 2006.

British Library "All in the Mind? Computer Science and Musical Creativity" – Sound Cases series, 26th October, 2010.

Other University Contribution

Research staff representative on University of Edinburgh Senatus, 1993–1996
Departmental fire officer 1989–1996
Departmental first aid officer, 1989–1999
Informatics Publicity Officer, Edinburgh, 1998–1999
Review Group Leader, Computing, City, 2000–2002
Senior Academic Adviser (Quality), Informatics, City, 2001–2004
Chair, Postgraduate Programme Monitoring Committee, Computing, Goldsmiths, 2004–2008
Department of Computing representative, Academic Board, Goldsmiths, 2004–2008
Goldsmiths representative, University of London External System Academic Board, 2005–2008
Programme Scrutiny Sub-Committee, Goldsmiths, 2005–2008
External System Committee, Goldsmiths, 2005–2008
IT Strategy Committee, Goldsmiths, 2006–2008
University of London External System 150th Anniversary Celebration Steering Group, 2006
Standards Scrutiny Sub-Committee, Goldsmiths, 2007–2008
University of London External System Information Systems Board, 2007–2008
Science and Music Steering Committee, Institute of Musical Research, University of London, 2007–2010
University of London External System English Review, Chair, 2007
External System English Programme Development Group, Goldsmiths, 2006—2007.

External Contribution

Miscellaneous

Technical and Financial Director, One Voice Company, 1994–2003 (see below)
Task Group member for Technology Foresight Programme, 1996–1999 (see below)
Member of SSAISB committee, 1997–present
Vice-chair of SSAISB committee, 1998–1999
Chair and Director of SSAISB, 2000–2003
Convention and symposium programme chair for AISB'99 convention
Chair of steering group of InterAction UK, the national network for creative media, of which I was the proposer, supported by the OST and DTI.

Technology Foresight Task group Membership; InterAction UK

The Technology Foresight Programme, under its ITEC (Information Technology, Electronics and Communications) panel, has set up a sub-group concerned with the promotion of the digital creative media industry in the UK. This in turn has set up a number of "task groups", each dealing with a different aspect of the matter. I was co-opted on to two of these task groups, one dealing with the establishment of a "community" for digital creative media workers and institutions, the other dealing with education and training in the field. I was the steering group chair of InterAction UK – the network for creative media, which was set up in response to my proposal to Foresight.

One Voice

One Voice was a music performance company, based in Edinburgh. It was a registered educational charity, which had various aims. The most important aim was to increase awareness amongst the public of contemporary music, and to break down artificial boundaries between styles and kinds of music which are largely imposed by learned attitudes.

A second function of the ensemble was to motivate community work in schools and at local community centres. These projects were aimed at stimulating creativity of the participants and raising awareness of social issues around which performances were based. A large scale project, funded by the National Lottery, involved the creation of a new teaching resource for Higher Music teachers in Scottish schools.

One Voice's 1995 "Electric Expression" project, in H M Prison, Perth, attracted a Merit Award for Sport and Art in Prisons from the Koestler Foundation.

Publications

All publications shown were published in peer-reviewed conference proceedings or peer-reviewed journals.

Sole Author

Wiggins, G. A. (1990). The improvement of Prolog program efficiency by compiling control: A proof-theoretic view. In *Proceedings of the Second International Workshop on Meta-programming in Logic*, Leuven, Belgium.

Wiggins, G. A. (1991). *An Adaptable Formalism for the Computational Analysis of English Noun Phrase Reference*. PhD thesis, Department of Artificial Intelligence, University of Edinburgh.

Wiggins, G. A. (1992a). Negation and control in automatically generated logic programs. In Pettorossi, A., editor, *Proceedings of META-92*. Springer Verlag, Heidelberg. LNCS Vol. 649.

Wiggins, G. A. (1992b). Synthesis and transformation of logic programs in the Whelk proof development system. In Apt, K. R., editor, *Proceedings of JICSLP-92*, pages 351–368. M. I.T. Press, Cambridge, MA.

Wiggins, G. A. (1994). Whelk Type Theory. In Turini, F. and Fribourg, L., editors, *Proceedings of the Fourth International Workshop on Meta-Programming in Logic and Logic Program Synthesis and Transformation, Pisa, Italy*, LNCS. Springer-Verlag, Heidelberg.

Wiggins, G. A. (1998a). Music, syntax, and the meaning of "meaning". In *Proceedings of the First Symposium on Music and Computers*, pages 18–23, Corfu, Greece. Ionian University.

Wiggins, G. A. (1998b). The use of constraint systems for musical composition. In Pachet, F. and Codognet, P., editors, *Proceedings of the ECAI'98 Workshop on Constraints and Artistic Applications*, Brighton, England.

Wiggins, G. A. (2006). A preliminary framework for description, analysis and comparison of creative systems. *Journal of Knowledge Based Systems*, 19(7):449–458.

Wiggins, G. A. (2007a). Models of musical similarity. *Musicae Scientiae*, Discussion Forum 4A:315–338.

Wiggins, G. A. (2007b). Review article: 'Computer Models of Musical Creativity' by David Cope. *Literary and Linguistic Computing*, page fqm025.

Wiggins, G. A. (2009a). Computer-representation of music in the research environment. In Crawford, T. T. and Gibson, L., editors, *Modern Methods for Musicology: Prospects, Proposals and Realities*, Digital Research in the Arts and Humanities, pages 7–22. Ashgate, Aldershot, UK.

Wiggins, G. A. (2009b). Semantic Gap?? Schematic Schmap!! Methodological considerations in the scientific study of music. In *Proceedings of 11th IEEE International Symposium on Multimedia*, pages 477–482.

Wiggins, G. A. (2010a). A cross-domain model? grouping of phonemes into syllables by a model of melodic segmentation. In *Proceedings of ICMPC-11*.

Wiggins, G. A. (2010b). Cue abstraction, paradigmatic analysis and information dynamics: Towards music analysis by cognitive model. *Musicae Scientiae*, Special Issue: Understanding musical structure and form: papers in honour of Irène Deliège:307–322.

Wiggins, G. A. (2010c). I let the music speak: A model of music perception that predicts speech segmentation. In *Proceedings of Cognitive Science*.

Wiggins, G. A. (2011a). Computer models of (music) cognition. In Rebuschat, P., Rohrmeier, M., Cross, I., and Hawkins, J., editors, *Language and Music as Cognitive Systems*, pages ??–?? Oxford University Press, Oxford.

Wiggins, G. A. (2011b). "I let the music speak": cross-domain application of a cognitive model of musical learning. In Rebuschat, P. and Williams, J., editors, *Statistical Learning and Language Acquisition*. Mouton De Gruyter, Amsterdam, NL. In press.

Main Author

Wiggins, G. A., Bundy, A., Kraan, I., and Hesketh, J. (1991). Synthesis and transformation of logic programs through constructive, inductive proof. In Lau, K.-K. and Clement, T., editors, *Proceedings of LoPSTr-91*, pages 27–45. Springer Verlag. Workshops in Computing Series.

Wiggins, G. A., Lemström, K., and Meredith, D. (2002). SIA(M)ESE: An algorithm for transposition invariant, polyphonic content-based music retrieval. In *International Symposium on Music Information Retrieval*, IRCAM, Paris, France.

Wiggins, G. A., Müllensiefen, D., and Pearce, M. T. (2010). On the non-existence of music: Why music theory is a figment of the imagination. *Musicae Scientiae*, Discussion Forum 5.

Wiggins, G. A., Papadopoulos, G., Phon-Amnuaisuk, S., and Tuson, A. (1999). Evolutionary methods for musical composition. *International Journal of Computing Anticipatory Systems*.

Wiggins, G. A., Pearce, M. T., and Müllensiefenllensiefen, D. (2009). Computational modelling of music cognition and musical creativity. In Dean, R., editor, *Oxford Handbook of Computer Music and Digital Sound Culture*. Oxford University Press.

Wiggins, G. A. and Trewin, S. (2000). A system for the concerned teaching of musical aural skills. In *Proceedings of ITS2000*, number 1839 in LNCS. Springer-Verlag.

Joint Author

Abbass, H. A., Wiggins, G. A., Lakshmanan, R., and Morton, B. (1999a). Integrating optimisation and search: An intelligent tool for chemical process synthesis. In *Proceedings of Practical Applications of Logic Programming*.

Abbass, H. A., Wiggins, G. A., Lakshmanan, R., and Morton, W. (1999b). Heat exchanger network retrofit by constraint logic programming. *Computers in Chemical Engineering*.

Allan, R. H., Wiggins, G. A., and Müllensiefen, D. (2007). Methodological considerations in studies of musical similarity. In *Proceedings of ISMIR*, Vienna, Austria.

Bown, O. and Wiggins, G. A. (2005). Modelling musical behaviour in a cultural-evolutionary system. In Gervàs, P., Veale, T., and Pease, A., editors, *Proceedings of the IJCAI'05 Workshop on Computational Creativity*.

Bown, O. and Wiggins, G. A. (2007a). Biocultural models of interaction between musical and non-musical forms of behaviour in evolution. In *Proceedings of the Society for Music Perception and Cognition*, Montreal, Canada.

Bown, O. and Wiggins, G. A. (2007b). Music: Evolution without adaptation. In Zon, B., editor, *Proceedings of Conference on Music and Evolutionary Thought*.

Bown, O. and Wiggins, G. A. (2007c). On the meaning of life (in artificial life approaches to music). In Cardoso, A. and Wiggins, G. A., editors, *Proceedings of the 4th International Joint Workshop on Computational Creativity*.

Bown, O. and Wiggins, G. A. (2009). From maladaptation to competition to cooperation in the evolution of musical behaviour. *Musicæ Scientiæ*. Special Issue on Evolution of Music.

Brandão, M., Pain, H., and Wiggins, G. A. (1999). Computers in music education. In *Proceedings of the AISB'99 Symposium on Musical Creativity*. AISB.

Bryson, J., Smaill, A., and Wiggins, G. A. (1992). The reactive accompanist: Applying subsumption architecture to software design. RP 606.

Bundy, A., Smaill, A., and Wiggins, G. A. (1990). The synthesis of logic programs from inductive proofs. In Lloyd, J., editor, *Computational Logic*, pages 135–149. Springer-Verlag. Esprit Basic Research Series.

Chan, T.-S. T. and Wiggins, G. (2002). Computational memetics of music. In *Proceedings of the ESOM 10th Anniversary Conference on Musical Creativity*, Liège, Belgium.

Chan, T.-S. T. and Wiggins, G. (2005). A computational memetics approach to music information and aesthetic fitness. In Colton, S., Gervás, P., and Veale, T., editors, *Proceedings of the 2nd International Joint Workshop on Computational Creativity*.

Chan, T.-S. T. and Wiggins, G. (2006). More evidence for a computational memetics approach to music

information and new interpretations of an aesthetic fitness measure. In Colton, S. and Pease, A., editors, *Proceedings of the 3rd International Joint Workshop on Computational Creativity*.

Clifford, R., Christodoulakis, M., Crawford, T., Meredith, D., and Wiggins, G. A. (2006). A fast, randomised, maximal subset matching algorithm for document-level music retrieval. In Lemström, K. and Dannenberg, R., editors, *Proceedings of the 7th International Conference on Music Information Retrieval (ISMIR 2006)*.

Craft, A., Wiggins, G. A., and Crawford, T. (2007). How many beans make five? the consensus problem in music-genre classification and a new evaluation method for single-genre categorisation sysytems. In *Proceedings of ISMIR*, Vienna, Austria.

Curry, B. and Wiggins, G. A. (1999). A new approach to cooperative performance: A preliminary experiment. *International Journal of Computing Anticipatory Systems*, 4.

Curry, B., Wiggins, G. A., and Hayes, J. (2000). Representing trees with constraints. In Lloyd, J., editor, *Procceedings of Computational Logic 2000*.

Ferrand, M., Nelson, P., and Wiggins, G. (2003a). Unsupervised learning of melodic segmentation: A memory-based approach. In Kopiez, R., Lehmann, A. C., Wolther, I., and Wolf, C., editors, *Proceedings of the 5th Triennial ESCOM Conference*, pages 141–144, Hanover, Germany. Hanover University of Music and Drama.

Ferrand, M., Nelson, P., and Wiggins, G. A. (2002). A probabilistic model for melody segmentation. In *Proceedings of ICMAI'02*. Springer-Verlag.

Ferrand, M., Nelson, P., and Wiggins, G. A. (2003b). Memory and melodic density: A model for melody segmentation. In *Proceedings of the XIV Colloquium on Musical Informatics (XIV CIM 2003)*, pages 95–98, Florence, Italy.

Forth, J., McLean, A., and Wiggins, G. A. (2008). Musical creativity on the conceptual level. In *Proceedings of the International Joint Workshop on Computational Creativity*, Madrid, Spain.

Forth, J., Wiggins, G., and McLean, A. (2010). Unifying conceptual spaces: Concept formation in musical creative systems. *Minds and Machines*, 20:503–532. 10.1007/s11023-010-9207-x.

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