This file is part of the following reference:


Access to this file is available from:

HIT SCRAPE CLICK DRAG: ANALYSIS AND APPLICATION OF
COMPOSITIONAL METHODS AT THE INTERSECTION OF CONSERVED AND
EMERGENT TECHNOLOGIES

A thesis
submitted with a DVD in fulfillment of the requirements for the award of
the degree of

Doctor of Philosophy

at

James Cook University

by

MATTHEW HILL B.A (Macquarie Uni), B.A (Cont. Mus)(Southern Cross Uni),
Dip. Ed (Uni of Melbourne), B.Mus (Hons) (James Cook Uni)

2007

School of Creative Arts
STATEMENT OF ACCESS

I, the undersigned, the author of this work, understand that James Cook University will make this thesis available for use within the University Library and, via the Australian Digital Theses network, for use elsewhere.

I understand that, as an unpublished work, a thesis has significant protection under the Copyright Act and I do not wish to place any further restriction on access to this work.

                      .............................................                      .............................................

                      (.............................................)
STATEMENT OF SOURCES

DECLARATION

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education.

Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

........................................... ...........................................

(...........................................)
ACKNOWLEDGEMENTS

This research would not have been possible without the generosity and support of family, friends, colleagues and supervisors. Firstly, to my wife Lisa Jacka, for providing care, motivation and perspective throughout, listening with enthusiasm, introducing me to the wonderful world of computers, providing ongoing technical support for all manner of computer related troubles, editing video and creating the DVD, and proofreading. My children, Gabriella and Cassandra, for encouraging efficiency in my work practices, providing constant grounding and perspective, and (Gabriella) for being the sound source and inspiration for the Electronic Study.

I am very grateful to my mother Marie de Monchaux for enthusiastically supporting my interest in music making, for child minding, cake making, and for providing a most suitable rehearsal venue for the major works. To Martin and Gillian Jacka for providing the ideal ‘finish your thesis’ environment in Adelaide, including the seaside house, child minding, dinners, beetroot dip, and a daily interest in my progress. To my sisters Angela and Patricia for reading sections of the thesis, and providing support and perspective throughout my candidature. To my brother Barry, my first and ongoing musical collaborator, for contribution to the major works as a performer, coordinator of the NSW contingent, and assistance in ensuring the smooth running of rehearsals.

To all the musicians involved, for their commitment and energy, Ian Brunskill, David Brammah, Rebecca McHutchison, Cleis Pearce and Simon Self, and also to Matthew Curnock for Torakina and the use of Old Pucker. To Michael Worthington for sensitivity and expertise. To Vicki Salisbury at Umbrella Studio for offering the venue for performance and recording of the major works, publicity and support. I am grateful
to Michael Whiticker and Bob Passmore for enabling numerous performance opportunities over the past three years and supporting live improvised music, and to David Salisbury for the Nemo experience, motivation and interest throughout. To Jack Sweetman for the tasteful aesthetic and swift realisation of the DVD cover.

Finally, my supervisors: to Diana Davis for a passion for the right word and fondness for a good figure; to Steven Campbell for technical assistance, compositional inspiration and the pursuit of precision; and, to Malcolm Vick for eagerly stepping in and expertly expediting completion.
The creation of music incorporating emergent technologies has occurred throughout history across a range of styles. In the past fifty years advances in electronic and, more recently, digital technologies have led to a range of new music making practices. Most recently, rapid advances in computer technology have enabled the results of complex digital manipulations of sound to be heard in real time, allowing the computer to become a powerful live performance and composition tool. As new technologies emerge, new musical forms based on various levels of synthesis of pre-composed and improvisation based composition methods are developed. This research seeks to identify, define, categorise, explore and develop compositional methods in which traditional composition techniques and emergent technologies intersect.

The research has historical, analytical and personal practice components and is situated in the fields of music analysis, music technology and composition. The deficiencies of existing analytical methodologies are discussed with particular reference to emergent technologies, music creation, recording practice, and interdisciplinary theoretical issues. A text-based, parametric analysis method is developed and applied to thirty-six selected key works in electronic/electroacoustic, improvised, rock and electronic dance music (EDM) genres. The works analysed originate from the USA, Europe and the UK and span the past seventy years. The analytical method considers the processes, shaping factors (i.e., contextual or extramusical elements) and inputs (i.e., textual or musical elements) involved in the creation of works and is intended to address both conserved and emergent technological elements. Observations made by the researcher are included alongside those from the literature.
The detailed analyses of the thirty-six selected key works are included as an Appendix, with a summary mapping of genre terrain included in the thesis. Whilst some generalisations about works within genres and between genres are made, the compositional methods identified constitute a complex and diverse set of music making practices. In general terms, in electronic, rock and EDM genres, traditional roles of composer, performer, producer and engineer are blurred, with individual artists moving between such roles. In improvised works a distinction between performer/composer and engineer is apparent. In more specific terms, the use of historically emergent sound sources distinguishes most of the electronic works at a timbral level. In some cases in the electronic genre, the sound source is an important conceptual driver for the structure of the works. In other genres, emergent sound sources often lead to an expansion of existing forms or used to supplement, or substitute for, traditional instrumentation.

The research makes a direct and explicit link between music analysis and music creation. The insights gained from the analyses are applied to the creation of eight new musical works: four genre-specific studies and four major works. Recordings of the practical works are presented, alongside video documentation of the rehearsal, performance and recording of the major works, on an accompanying DVD. A compartmentalised and hybridised approach to composition is utilised, drawing directly from the parametric analysis method. The practical works feature both solo and group ensembles and incorporate traditional instrumentation and digitally sampled and synthesised elements. A range of individual and collaborative ‘top down’ and ‘bottom up’ processes are explored. A computer based performance instrument (CBPI) is developed using the software Max/MSP. The CBPI embeds compositional elements identified in the analyses (relating to sound source, sound processing, rhythm, pitch,
texture, and spatial elements), and is utilised in the creation of the major works. The compositional approach crystallises and extends many aspects of past personal practice. The eight practical works represent some of the possibilities of both the CBPI and the analysis/creation model.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................ III

ABSTRACT ............................................................................................................................. V

LIST OF TABLES ................................................................................................................... XII

LIST OF FIGURES ................................................................................................................. XIV

CHAPTER ONE: INTRODUCTION ......................................................................................... 1

1.1 Technology and Music Creation .................................................................................. 1

1.2 Music Creation and Music Analysis ........................................................................... 4

1.3 Rationale for Research ............................................................................................... 7

1.4 Research Questions and Aims of Research ................................................................. 8

1.5 Organisation of the Study ........................................................................................... 9

CHAPTER TWO: FIELD AND PERSPECTIVE: TECHNOLOGY AND PERSONAL PRACTICE ............................................................................................................... 10

2.1 Defining Technology .................................................................................................. 10

2.2 Technology in Music: Overview of History and Practice ............................................ 13

2.3 Relationship Between Music and Technology ............................................................ 16

2.4 Research Position: Filter of Personal Practice ............................................................ 20

2.4.1 Environment ........................................................................................................... 21

2.4.2 Education ............................................................................................................... 24

2.4.3 Performance / Composition ................................................................................... 25

2.4.4 Filter of Personal Practice Summary ...................................................................... 30

CHAPTER THREE: MUSIC ANALYSIS: DIMENSIONS AND DIRECTIONS .32

3.1 Introduction .................................................................................................................. 32

3.2 Dimension 1: Musical Frame ...................................................................................... 38

3.3 Dimension 2: Spatial Frame ....................................................................................... 42

3.4 Dimension 3: Specialist Knowledge .......................................................................... 45

3.5 Dimension 4: Validity ................................................................................................ 50
LIST OF TABLES

Table 2.1. Personal Practice Summary ................................................................. 31
Table 4.1. Analysis Template .............................................................................. 74
Table 5.1. Selected Key Works in Electronic Genre ........................................... 82
Table 5.2. Resonances Observed Between Factors Shaping Selected Key Works and
Factors Shaping the Creation of the Electronic Study ...................................... 88
Table 5.3. Elements of Personal Interest and Elements of Electronic Study .......... 89
Table 5.4. Selected Key Works in Improvised Genre ......................................... 95
Table 5.5. Resonances Observed Between Factors Shaping Selected Key Works and
Factors Shaping the Creation of the Improvised Study ..................................... 108
Table 5.6. Elements of Personal Interest and Elements of Improvised Study ....... 109
Table 6.1. Selected Key Works in Rock Genre .................................................... 118
Table 6.2. Resonances Observed Between Factors Shaping Selected Key Works and
Factors Shaping the Creation of the Rock Study .............................................. 127
Table 6.3. Elements of Personal Interest and Elements of Rock Study .............. 128
Table 6.4. Key Works Selected in Electronic Dance Music Genre ...................... 137
Table 6.5. Resonances Observed Between Factors Shaping Selected Key Works and
Factors Shaping the Creation of the EDM Study ............................................. 145
Table 6.6. Elements of Personal Interest and Elements of EDM Study ............. 146
Table 7.1. Relationship Between Storehouse of Elements of Interest from Analyses and
Development of CBPI ................................................................................... 157
Table 7.2. CBPI Modules and Sub-modules, Function(s) and Incorporated
Compositional Method(s) ................................................................. 164
Table 7.3. Source/Modulation Matrix ................................................................. 180
Table 7.4. External Control Mapping of CBPI ...................................................... 190
Table 8.1. *Resonances Observed Between Factors Shaping Selected Key Works Analyzed and Factors Shaping the Creation of the Major Works* ........................................... 197

Table 8.2. *Selected Elements of Interest and Elements of “Hit”* ........................................... 207

Table 8.3. *Selected Elements of Interest and Elements of “Scrape”* ...................................... 214

Table 8.4. *Selected Elements of Interest and Elements of “Click”* ....................................... 222

Table 8.5. *Selected Elements of Interest and Elements of “Drag”* ....................................... 231
LIST OF FIGURES

Figure 1.1. The creation of a musical work. ................................................................. 5

Figure 3.1. Analytical perspectives of existing analytical methodologies. .............. 32

Figure 3.2. Issues in musical analysis: The continua. .................................................. 35

Figure 3.3. Issues in musical analysis: Key dimensions in relation to selected analytical methodologies............................................................ 37

Figure 3.4. Issues in musical analysis: Key dimensions in relation to selected contemporary analytical methodologies. ..................................................... 58

Figure 4.1. Research schema....................................................................................... 64

Figure 4.2. Overview of personal influences categorised according to genre. .......... 67

Figure 5.1. The creation of a musical work: Features of electronic works highlighted. 87

Figure 5.2. Electronic Study: Relationship of various parameters to control signal and programmatic association......................................................... 93

Figure 5.3. Electronic Study: Max/MSP realisation flow chart. .............................. 94

Figure 5.4. The creation of a musical work: Features of improvised works highlighted. ......................................................................................... 107

Figure 5.5. Improvised Study: form diagram......................................................... 112

Figure 5.6. Improvised Study: Basic audio and control flow chart..................... 115

Figure 5.7. Improvised Study: Interaction mode flow chart. ............................... 116

Figure 6.1. The creation of a musical work: Features of rock works highlighted.... 126

Figure 6.2. Rock Study: Rhythm section excerpt (for sax solo and coda)............. 130

Figure 6.3. Rock Study: Saxophone choir at 4’00”............................................. 130

Figure 6.4. Rock Study: Vocal lead sheet............................................................. 131

Figure 6.5. Edit window of Pro Tools session for Rock Study............................. 136

Figure 6.6. The creation of a musical work: Features of EDM works highlighted...... 144
Figure 6.7. Edit window of Pro Tools session for EDM Study........................................ 152

Figure 7.1. Overview of CBPI development process...................................................... 154

Figure 7.2. CBPI performance interface........................................................................ 163

Figure 7.3. Front panel of 'groove' module................................................................. 166

Figure 7.4. ‘Groove module’: Sub-module flow chart.................................................. 168

Figure 7.5. Patcher p groove: Hidden detail............................................................. 169

Figure 7.6. Patcher p panning options: Manual mode................................................ 170

Figure 7.7. Patcher p panning options: Cycle mode.................................................... 170

Figure 7.8. Patcher p panning options: Curve mode................................................... 171

Figure 7.9. Patcher p panning options: Random mode............................................... 172

Figure 7.10. Patcher p panning options: Notein mode............................................... 173

Figure 7.11. Patcher p notein control: Range, root key and keyboard split................. 174

Figure 7.12. Patcher p notein control: MIDI to frequency conversion and amplitude
          outputs............................................................................................................. 175

Figure 7.13. Front panel of ‘wave’ module................................................................. 176

Figure 7.14. Patcher p wave: Excerpt of hidden detail............................................... 178

Figure 7.15. Hidden detail of ‘read once’ mode in ‘wave’ module............................... 179

Figure 7.16. Front panel of ‘Peak amplitude reporting’ module.................................. 180

Figure 7.17. Hidden detail of patcher p peakamp....................................................... 181

Figure 7.18. Front panel of ‘LFO’ module................................................................. 182

Figure 7.19. Front panel of ‘harmony tables’ module................................................ 183

Figure 7.20. Hidden detail of patcher p harmony tables............................................ 184

Figure 7.21. Front panel of ‘interact’ module............................................................. 185

Figure 7.22. Front panel of ‘random’ module............................................................. 186

Figure 7.23. Hidden detail of ‘random’ module.......................................................... 187
Figure 7.24. Front panel of ‘tempo’ module. ................................................................. 187

Figure 7.25. Hidden detail of internal sync portion of patcher \textit{p sync}. ......................... 188

Figure 7.26. Hidden detail of external sync portion of patcher \textit{p sync}. .......................... 188

Figure 7.27. Front panel of ‘control’ module. ................................................................. 191

Figure 8.1. “Hit”: Graphic form chart. ............................................................................ 210

Figure 8.2. “Hit”: Section B notated parts. ................................................................. 211

Figure 8.3. “Hit” section A: Approximate ‘wave’ modules’ settings. ...................... 212

Figure 8.4. “Hit” section A: Approximate ‘groove’ module settings. ...................... 213

Figure 8.5. “Scrape”: Graphic form chart. .................................................................... 217

Figure 8.6. “Scrape”: Notated parts ................................................................. 218

Figure 8.7. “Scrape”: Drum samples pattern, section B, part 1 ......................... 219

Figure 8.8. “Scrape”: Drum samples pattern, section B, part 2 ......................... 219

Figure 8.9. “Scrape”: ‘Wave’ module settings ......................................................... 220

Figure 8.10. “Scrape”: ‘Groove’ module settings .................................................... 221

Figure 8.11. “Click”: Graphic form chart. ................................................................. 225

Figure 8.12. “Click”: Section B melody ................................................................. 225

Figure 8.13. “Click”: Drum sample pattern. ........................................................... 226

Figure 8.14. “Click”: ‘Groove’ and ‘wave’ module settings for section A .......... 228

Figure 8.15. “Click”: ‘Peakamp’ module settings .................................................... 230

Figure 8.16. “Drag”: Graphic form chart. ................................................................. 234

Figure 8.17. “Drag”: Notated parts. ................................................................. 236

Figure 8.18. “Drag”: Drum sample patterns .......................................................... 237

Figure 8.19. “Drag”: Initial settings of ‘wave’ modules. ........................................ 238