

Developing a style at the intersection between analogue and digital animation production

by Simon Rippingale

Thesis submitted in fulfilment of the requirements for
the degree of

Doctor of Philosophy

under the supervision of Professor Andrew Johnston and
Dr Andrew Bluff

University of Technology Sydney
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September 2022

CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Simon Rippingale, declare that this thesis, is submitted in fulfilment of the requirements for the award Doctor of Philosophy, in the Faculty of Engineering and Information Technology at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

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DEVELOPING A STYLE AT THE INTERSECTION BETWEEN ANALOGUE AND DIGITAL ANIMATION PRODUCTION



ABSTRACT

This research project applies practice-based research methods to explore the intersection between analogue and digital animation production. The aim is to develop a visual style combining the tangible qualities of filming miniature sets and the fluid flexibility of computer-generated animation techniques.

Case studies of two animation projects that developed and refined a motion control camera system are presented. The system involved integration and creative control between key-framed cameras in animation software and physical cameras filming shots on miniature sets using industrial robotic arms. Associated approaches to this hybrid style of animation production workflow are presented, including game engines, 3D printing, point cloud scanning and other techniques. The refined method of hybrid production can form the basis for future productions seeking to build upon this technical and stylistic foundation.

ACKNOWLEDGEMENTS

This research project was supervised by Professor Andrew Johnston and Dr Andrew Bluff.

The research involved significant collaboration with many artists, researchers and technicians from the University of Technology Sydney (UTS) and the Australian animation and visual effects Industry.

The animation case studies were funded and produced in collaboration with the team at Jericho, a branch of the Royal Australian Air Force dealing with research innovation and academic engagement.

Both animation case studies were made in collaboration with artists and researchers Andrew Bluff and Louis Pratt and VFX students Alessandra Grasso, Ben Steek, Mai Pham, Emma Cooney, Carol Amadio and Aaron De Leon at UTS Animal Logic Academy. *Jasper* was made in collaboration with Mark van den Bergen, VFX Supervisor, and Gregory Naud, Lead Animator.

The miniature set shoot for each case study was filmed on a Kuka robotic arm at the Advanced Fabrication Lab, Faculty of Design, Architecture and Building, UTS, in collaboration with robot technicians Tran Dang and Gwyn Jones.

Jarli was co-directed by filmmaker Chantelle Murray and produced by Ryan Greaves, who led a team from animation production company Like A Photon Creative, Brisbane. This case study’s story and screenplay were developed with writers Andrew Dillon, Jon Bell and Erica Harrison.

The roles played by key researchers, technicians and artists who made valuable contributions to this research project were:

	Case Study 1: <i>Jasper</i>	Case Study 2: <i>Jarli</i>
Andrew Johnston	Research supervisor / Producer	Research supervisor / Producer
Andrew Bluff	Researcher	Researcher
Louis Pratt	Researcher / Art Director	Researcher / Art Director
Tran Dang	Robot Tech	Robot Tech
Gwyn Jones	Robot Tech	Robot Tech
Ben Streek	Researcher / Composer	
Brycen Horne	Cinematographer	
Alessandra Grasso	Producer / Lighting Artist	
Mark Van den Bergen	VFX Supervisor	
Great Naud	Lead Animator	
Mai Pham	Concept Artist /Animator	
Ryan Greaves		Producer
Chantelle Murray		Co Director
Andrew Dillon		Writer
Jon Bell		Writer
Erica Harrison		Writer
Evan Papageorgiou		Cinematographer
Egan Wessener		VFX Supervisor
Tanya Vincent		Lead Animator
Evan Atherton		Mimic Supervisor

Capstone Editing provided copyediting and proofreading services, according to the guidelines laid out in the university-endorsed national ‘Guidelines for Editing Research Theses’.

CONTENTS

ABSTRACT	iv
ACKNOWLEDGEMENTS	v
LIST OF FIGURES	ix
LIST OF TERMINOLOGY AND ABBREVIATIONS	xii
1 INTRODUCTION	1
1.1 Context.....	3
1.2 Background	3
1.3 Animation style	4
1.4 Research questions	6
1.5 Video links.....	7
1.6 About the researcher	7
2 LITERATURE REVIEW	8
2.1 Overview	8
2.2 What makes good cinema.....	9
2.3 Animation and VFX.....	10
2.4 Miniatures in storytelling	11
2.5 Hybridity and Bricolage	11
2.6 Hybridity in Film and Animation.....	13
2.7 Early animation and VFX movies	15
2.8 The beginnings of digital visual effects in cinema	19
2.9 Computer-generated imagery.....	20
2.10 Contemporary animation works	21
2.11 Laika	21
2.12 Aardman Animations	22
2.13 Wes Anderson	23
2.14 Commercial Work	26
2.15 <i>Invention of Together</i>	26
2.16 <i>Share Your Gifts</i>	27
2.17 <i>Save Ralph</i>	28
2.18 <i>The Gruffalo</i>	28
2.19 CGI in cel animation	30
2.20 Studio Ghibli and Princess Mononoke	30
2.21 <i>The Red Turtle</i>	30
2.22 Literature Review Conclusion.....	31
3 RESEARCH METHODS	33
3.1 Introduction	33
3.2 Theoretical frameworks	34
3.3 Practice-based research	35
3.4 Practice-led research.....	36
3.5 Reflective Practice.....	36
3.6 Strategies for practice-based research	38
3.7 Strategies for reflection-in-action	40
3.8 The strategies for reflection-on-action:	40
3.9 Gathering data	42
3.10 Interviews.....	43
3.11 Artefacts.....	44
3.12 Ethical considerations	44
3.13 The role of the researcher.....	45
3.14 Indigenous storytelling.....	45
3.15 Conclusion.....	45
4 CASE STUDY 1: <i>Jasper</i>	47
4.1 Background	47
4.2 Research aims and objectives	50

4.3 Research and development and early testing phase	51
4.4 Storyboard and concept design	51
4.5 Production designing miniature sets.....	53
4.6 Unreal Engine and Unity	57
4.6.1 Pre-vis of miniature set design	57
4.6.2 Pre-vis of animation for the on-set shoot.....	57
4.6.3 Set extensions.....	58
4.7 Character modelling.....	59
4.8 Motion control shot development.....	62
4.9 Motion control on <i>Jasper</i>	63
4.10 Using point clouds.....	65
4.11 Motion controlled camera pathway	69
4.12 The miniature set shoot	70
4.13 Animation.....	74
4.14 Surfacing and lighting.....	77
4.15 Compositing	79
4.16 Sound and music	80
4.17 Conclusions and findings for Case Study 1: <i>Jasper</i>	82
5 CASE STUDY 2: <i>Jarli</i>	86
5.1 Introduction	86
5.1.1 Storytelling in collaboration with First Nations filmmakers and artists.....	87
5.2 Pitching and early development	87
5.3 Research aims and objectives	88
5.4 Story development.....	88
5.5 The writers' room.....	89
5.5.1 Indigenous astronomy and cultural specificity	90
5.6 Beat sheet and screenplay	92
5.7 Collaboration with Chantelle Murray.....	93
5.8 Technical research and development phase.....	93
5.9 Research questions	94
5.10 Equipment and hardware components	95
5.10.1 Aligning the virtual workspace.....	96
5.10.2 Aligning the real-world workspace	99
5.10.3 Test 1: Star foot registration tool	99
5.10.4 Test 2: Etched floor grid system.	101
5.10.5 Test 3: Lens grid as registration tool.....	102
5.10.6 Test 4: Test shoot.....	102
5.10.7 Double robots	104
5.10.8 Summary of test phase	104
5.11 Research and development conclusions.....	106
5.12 Collaborations with Chantelle Murray and Like a Photon Creative	106
5.13 Concept development and production design.....	106
5.13.1 Concept art	107
5.14 Miniature set production design.....	108
5.15 Miniature sets build	110
5.16 Character design and 3D modelling	113
5.16.1 Storyboarding, animatic and pre-vis.....	114
5.17 Storyboard edit	117
5.18 Shot design.....	117
5.19 The miniature set shoot	121
5.20 Working with Like A Photon Creative layout shots	123
5.21 Creative camera changes	125
5.22 Motion control camera pathway	127
5.23 Camera specs	128
5.24 Deep focus v. shallow focus	128
5.25 The various passes	130

5.26 Match move fixes	130
5.27 Animation.....	131
5.28 Compositing and digital set extensions.....	132
5.29 Sound and music	133
5.30 Conclusions: <i>Jarli</i>	134
5.30.1 Development of animation style on <i>Jarli</i>	134
6 CONCLUSION	142
6.1 Interview findings.....	144
6.2 Future works	146
7 REFERENCES.....	149
APPENDIX A: SCREENING AND AWARDS	155
APPENDIX B: SLIDE SHOWS FOR INDUSTRY PRESENTATION	156
APPENDIX C: ARTEFACTS AND BEHIND THE SCENES VIDEOS.....	157
APPENDIX D: INTERVIEW EXCERPT.....	158
APPENDIX E: ZOETROPE	168
APPENDIX F: EXHIBITION AT THE 2019 AVALON AIRSHOW	169

LIST OF FIGURES

Figure 1.1: Production still from short animation Case Study 1: Jasper.	1
Figure 1.2: Miniature set shoot from short animation Case Study 2: Jarli.	2
Figure 1.3: Crew on miniature set shoot of short animation Case Study 1: Jasper, 2018.	5
Figure 4.1: Production still from Jasper short animation.	47
Figure 4.2: Early concept art for Jasper.	48
Figure 4.3: Early concept art for Jasper.	49
Figure 4.4: Early concept art for Jasper.	50
Figure 4.5: Character design for Jasper by Mai Pham.	51
Figure 4.6: First-pass Jasper storyboards.	52
Figure 4.7: A storyboard from roughly composited against miniature set footage for animation reference.	53
Figure 4.8: Miniature set being scenic detailed for Jasper.	54
Figure 4.9: Jasper set under construction in Marrickville, Sydney.	55
Figure 4.10: Jasper set about to be carved using designs based on first pass of pre-visualisation.	56
Figure 4.11: The coastal forest landscape of Jasper starting to come together.	56
Figure 4.12: Augment reality experiments using one of the Jasper miniature set pieces.	58
Figure 4.13: Skies for Jasper were generated in Unreal Engine.	59
Figure 4.14: Skies for Jasper were generated in Unreal Engine.	59
Figure 4.15: Set extensions of miniature sets for Jasper before and after compositing.	60
Figure 4.16: Jasper as an adult and as a 10-year-old.	61
Figure 4.17: Jasper’s hair and skin texture were developed to try and help the model feel like it was a miniature, hand-modelled object.	61
Figure 4.18: A simple left to right camera move on A Cautionary Tail using frame-by-frame motion control.	62
Figure 4.19: Early testing on the KUKA KR 120.	63
Figure 4.20: A and B animation positions mapped against video timing reference and the animatic.	64
Figure 4.21: A and B camera positions mapped from point cloud scan data.	65
Figure 4.22: Tech vis of shooting space and capturing background elements as point clouds.	66
Figure 4.23: Blocking passes are translated into Maya camera moves on a point cloud of the miniature set.	67
Figure 4.24: Tech vis of cinematographer Brycen Horne blocking each shot on the same set.	67
Figure 4.25: Our first attempt at communicating camera moves to the KUKA was through spreadsheets.	68
Figure 4.26: Case Study 1: Jasper: Motion control camera pathway.	69
Figure 4.27: The miniature set shoot crew on the 2-day Jasper shoot.	70
Figure 4.28: The animation team working on the Jasper miniature set shoot.	71
Figure 4.29: An added shot to the production schedule to test a more ambitious, multiple axis camera rotation idea.	72
Figure 4.30: Tracking markers and lighting references on the Jasper miniature set.	73
Figure 4.31: Storyboard frame and final animation composited with miniature background.	74
Figure 4.32: A storyboard frame bash comped with miniature footage and an animation shot using the point cloud set scan for reference.	75

Figure 4.33: Run cycle tests in the early stages of animation on Jasper.	76
Figure 4.34: We used a more staccato, 12 fps approach on the wider shots.....	76
Figure 4.35: We used a smoother, 24fps approach on the closer, more emotive shots.....	77
Figure 4.36: Miniature set point cloud scans used as reflective, interactive lighting in the compositing process.	78
Figure 4.37: Lighting references and tracking markers on the Jasper miniature set.....	79
Figure 4.38: The various shoot passes on the Jasper miniature set. Then the first pass composite.....	80
Figure 4.39: We worked with RAAF pilot Squadron Leader Jacqueline Killian to give a relatable, authentic voice to the Jasper story.	81
Figure 4.40: Production still from Jasper.....	82
Figure 4.41: Production still from Case Study 1: Jasper.	84
Figure 4.42: Production still from Case Study 1: Jasper.	85
Figure 5.1: Production still from Jarli.....	86
Figure 5.2: Early concept artwork for Jarli.....	87
Figure 5.3: Concept artwork from Jarli.	91
Figure 5.4: The Emu features as a theme in Astronomy storytelling from Indigenous cultures across the Australian continent.....	92
Figure 5.5: A story beat from the Jarli screenplay.....	92
Figure 5.6: Early tests of the Maya–Mimic–KUKA pipeline on a KUKA KR 10.	93
Figure 5.7: The red camera on the KUKA robot moves through the tracking down the hillside shots.	94
Figure 5.8: Artec Leo scanning a temporary test miniature set.	96
Figure 5.9: Test miniature set scan.....	96
Figure 5.10: Aligning the virtual workspace.	98
Figure 5.11: The physical and digital models of Star Foot miniature set registration sheet used for CNC cutting the physical piece for testing.	100
Figure 5.12: VFX artist Andres Wanda and the research team using a laser tool to align the camera and robot set-up.	101
Figure 5.13: The first camera moves designed to run on a test set using the Mimic pipeline.....	103
Figure 5.14: The UTS Advanced Fabrication Lab team attached the smaller KUKA as a tool set on the larger KUKA tool head for better reach.....	104
Figure 5.15: 105	
Figure 5.16: Early character designs for Jarli.	107
Figure 5.17: Bike plane designs by Nathan Geppert.....	108
Figure 5.18: Desert canyon set at the studio in Marrickville, Sydney.	109
Figure 5.19: Moon surface miniature set.	109
Figure 5.20: Jarli’s house interior set.....	110
Figure 5.21: The aircraft hangar and desert tree miniature sets under construction.....	111
Figure 5.22: The aircraft hangar miniature sets under construction.....	112
Figure 5.23: The hangar exterior set detail.	113
Figure 5.24: Maya shot blocking and storyboarding.	115
Figure 5.25: The canyon set was a narrow fit and would not have been achieved without the two robot system.	116

Figure 5.26: Storyboards by Paul Kassab.....	116
Figure 5.27: A frame from cinematography tool Artemis showing camera and lens data.....	118
Figure 5.28: Point cloud scans of the desert landscape miniature set pieces with shots blocked in Maya on the digital versions of the KUKA robot set up.....	119
Figure 5.29: Moon surface miniature set being scanned.....	120
Figure 5.30: Moon surface scan camera blocking.....	120
Figure 5.31: Tran Dang tests the double robot set up with motion paths published from Mimic.....	121
Figure 5.32: Jarli house interior on Day 1 of the miniature set shoot.....	122
Figure 5.33: An aerial view looking down on the desert.....	123
Figure 5.34: Mimic operator Louis Pratt and robot technician Tran Dang adapted to become our on-set layout team.....	124
Figure 5.35: The hilltop set on shoot day.....	125
Figure 5.36: Turning the desert shots on their side to film looking up at the sky between the canyon walls as Jarli flies overhead.....	126
Figure 5.37: Case Study 2: Jarli: Motion control camera pathway.....	127
Figure 5.38: The hangar exterior miniature on set with blue screen and a frame from the final film.....	129
Figure 5.39: The hilltop section of the desert canyon set against blue screens.....	130
Figure 5.40: The Jarli flying shots moved fast over an all-digital background, in contrast to the hybrid production process.....	132
Figure 5.41: Production stills from the Jarli short.....	138
Figure 5.42: Production stills from the Jarli short.....	139
Figure 5.43: Production stills from the Jarli short.....	140
Figure 5.44: Production stills from the Jarli short.....	140
Figure E1: Jasper zoetrope.....	168

LIST OF TERMINOLOGY AND ABBREVIATIONS

AACTA	Australian Academy of Cinema and Television Arts
AEAF	Australian Effects & Animation Festival
CG	computer-generated
CGI	computer-generated imagery
fps	frames per second
GPU	graphics processing unit
HDRI	High Dynamic Range Image. An HDRI is a panoramic digital image that covers the full 360-degree spherical field of vision and contains a large amount of data (typically 32 bits per pixel per channel). HDRIs are most often used to emit light into a CG scene.
Hybrid Production Style	shorthand for the animation production style central to this research project. Hybrid production style refers to the compositing of 3D animated characters with footage filmed using miniature sets.
pre-vis	pre-visualisation
RAAF	Royal Australian Air Force
STEM	science, technology, engineering and mathematics
UTS	University of Technology Sydney
VFX	visual effects