

**Expressivity and the Digital Puppet:
Mechanical, Digital and Virtual Objects
in Games, Art and Performance**

by

Ian John Grant

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One

Shadows

1.1 INTRODUCTION: SURFACES AND SHADOWS

The current chapter, Surfaces and Shadows, explores the interface between traditional shadow puppetry and emerging computer technologies, through historical, theoretical enquiry, case studies and practical experiments. The thesis as a whole will evaluate and test with *users* (puppeteers, audiences, animators and programmers) the expressive qualities of innovative interactive digital puppetry, also known as performance animation systems. This chapter presents the design and testing of one such prototype application: the ‘ShadowEngine’ running on an multitouch portable device, the Apple iPad.

As a practice led project, the chapter presents an exegesis of the software design process for a prototype application called the ‘ShadowEngine’, that makes multi-touchable digital shadow theatre possible using physics based real-time animation and I indicate some preliminary design level insights and present potential approaches to project evaluation and testing. The animatable characters and objects are curiously expressive, and the analysis begins to refine the hermeneutic issues involved when operating and viewing complex multi-jointed characters in a physics-based 3D (pseudo 2D) environment.

So the following chapter will start to:

- Define The Expressive;
 - As a Quality Of Performance;
 - As an Outcome Of Interpretation / Reception;
 - As a Quality Of Design;

Then I seek to:

- Define The Shadow Puppetry Context;
- Define Media Art Contexts Where Shadow Digital Puppetry Is Key

Then I present:

- Multitouch As An Expressive Responsive/Interactive Approach
- Document The Design Processes of the Shadow Engine V001
- Evaluate The Expressive Properties Of The Software With Puppeteers And Audiences
- Some Theoretical Insights

In exploration of practices akin to puppetry, the research draws on instances of performance, games and installation art practice in wider cultural practice and the practical explorations of the author. This focus is multi-disciplinary.

The current chapter seeks to historicise in and around the spaces occupied by digital shadow puppets and establish key definitions and articulate emerging theoretical ideas.

A methodological approach, resonant with a *media archeology*, traces how traditional puppetry forms, often described by their mode of interaction/media, (rods, shadows, strings and gloves) – map into current paradigms of interaction with virtual worlds, digital objects and automated animation.

Sherry Turkle has developed a mode of enquiry to understand how we think and express through *evocative objects*. I argue digital puppets are a special class of evocative object. In addition to Turkle, I will consider multiple approaches to the theorisation of the object in cultural practice: again this is drawn from a variety of domains (e.g. John Dewey's *expressive object* in *Art as Experience*(Dewey, 2005) to Baudrillard's complex *system of objects*, *Baudrillard:1988la*).

All styles of puppet manipulation rely on gestural interaction. The current chapter primarily considers the performative/expressive potential of multi-touch systems and the tactile control of on screen characters.

In the emerging domain of digital shadow puppetry, whole-body, face, hand interactions are also prominent. Due to the plurality of forms involved in shadow theatre (human shadowgraphs, cut or etched objects made of hide, paper, metal, card etc., different world traditions), I am consciously conceptually gregarious and will analyse examples drawn across these forms.

I ask a broader question: How do new and emerging technologies facilitate innovative techniques of design and control over puppet-like objects and create experiences of expressive play?

Expressive Digital Shadow Puppetry

Expressive Digital Shadow Puppetry

Play And Production

- involvement and flow
- dimensions of expressivity
- heuristics
- qualitative insights into post play experiences
- decomposition [WHAT DO I MEAN BY THAT]
- designing a test study

Studying the nexus of ‘expressivity’ betwixt and between designer, performer, audience, around object software development and future The current study in contemporary shadow puppetry adopts the interesting position *not* to be a about a religious or anthropological investigation of non-Western shadow performance traditions. Instead it is about the ‘syncretic’ act of hybridity where ancient performance forms meet the most contemporary of multimedia technologies: computer vision and interactive ‘alternative realities’.

When I say ‘most contemporary’, I acknowledge that some of the current techniques acquiring popularity and dissemination across the internet and other media art contexts, have antecedents and a historicity that I also wish to outline.

1.2 EXPERIMENTAL METHODOLOGY

1.3 A DESCRIPTION OF SHADOW PLAY

(Schönewolf, 1969, check out)

(Currell, 2007, Currell (2007))

The domain of puppetry is a broad area and reflects performance and artefacts of vastly varied form and style.

Animated objects or things, and bringing an illusion of agency or life-likeness, is at the heart of all puppetry. Live control of performing objects and the co-presence of the operator / puppeteer is also key to most established definitions of the puppet. This brings a fundamental exclusion, in definition, of recorded film animation techniques and contemporary acts of digital animation

However, traditional shadow craft has been a prominent element in recent research and papers surrounding computer graphics and real-time systems. [LIST THEM WITH A SHORT PRECIS]

(Tan Kian Lam, 2008, Tan kian lam (2008)) Real-Time Visual Simulation and Interactive Animation of Shadow Play Puppets Using OpenGL (Li and Hsu, 2007, Li and Hsu (2007)) - An Authoring Tool for Generating Shadow Play Animations With Motion Planning Techniques.

(Mitra and Pauly, 2009, Mitra and Pauly (2009)) Shadow Art (Saltz, 2004-2005, Saltz (2004-2005)) Virtual Vaudeville projects

This goes hand in hand with the computer simulation of light and shadows and virtual space.

((1996), Editor, Jurkowski (1996)) strikes a set of distinctions

“Human imagination can give life to all simulacra... . Another form of animation has a physical dimension, and refers to indirect (mechanical) or direct (human) manipulation. Although mechanical figures are sometimes termed “puppets”, the puppet in its pure form is a figure manipulated by direct human agency, that is, by the puppeteer.

The digital practices I'm researching and discovering are hybrid and often combine elements of pre-made animation, procedural computer generated animation (e.g. physics simulation animating 'rigidbodies', or the 'motion planning' approaches of (Li and Hsu, 2007, Li and Hsu (2007))) and, relatively unique to my current project, the role of real-time puppeteer controlled animation for performance, mediated by computer software.

The term 'performance animation' attempts to capture the hybrid disciplines that challenge

IS A PROJECTION / PROJECTED IMAGE A SHADOW? Fundamentally yes.

:"A broad definition of a shadow puppet would be: a two-dimensional figure shown against a semi-translucent screen and lit so that an audience on the opposite side of the screen can see the shadow of the figure only" (Wright, 1986, p.139)

The design manufacture and operation of any puppet is key to it's expressive qualities

For figurative silhouettes, the posture, gesture and poise,

Aesthetic qualities of the object itself (translucency, colour, cutting and finish)

For the purposes of comparison of shadow puppets

hinges, joints and constraints to movement use of torque gravity and friction for animation

rods- stability, control, points/centres of force 3 rods, some on joints, moveable parts of the puppet, others fixed

use of light

a fusion of primary, secondary (sometimes more) points of shadow-casting illumination - creates complex multiple shadows, umbra and penumbras for the same object

lighting effects,

outdoor flame as shadow-casting - in wayang / java - spiritual contexts for the flickering flame casts an subtly animated shadow

Some shadow puppet traditions (NAME THEM) have control rods with pins, or sharp protuberances on the ends enabling them to be removed, while an object

is in use, and stuck in other parts of the figure, enabling more subtle and flexible control over movement.

[mise-en-scene]

An emerging theme: puppetry (as an artform) has been ‘on the brink of belonging’ an outsiders pursuit. Research papers on digital forms of shadow theatre herald the demise of live, traditional craft based pursuits:

.”The art of shadow play is slowly disappearing simply due to the lack of interest in the younger generation. There is a need for us to promote and provide greater accessibility to, and preserve this masterpiece using present technologies such as digital media.” [SOURCE]

So digital media is seen as part of the solution, rather than part of the problem live forms face.

Digital Analogies

Constructional / functional histories of puppetry often miss or underplay the wider cultural contexts. I’ve grouped the thesis into the traditional technical (shadows for example) only to emphasise parallel, associated phenomenon in the digital domain. Firmly placing a consideration of puppetry into a radical ‘multidisciplinarity’, like Jurkowski, as simulacra, as theatre, as tools or instruments for human expression.

The Cinematics of Shadow Play

The Cinematics of Shadow Plays:

2D Puppet Forms in Digital Space

Thus, there is a need for more research in real-time generation of shadow puppet images and interactive animation of the puppets. (Tan Kian Lam, 2008, p.213)

As argued, the kinetic properties are central to the expressive potential of an object. How the object moves, is jointed, and articulated

As I expect to demonstrate through an experimental approach and evaluations of the performer and audiences qualitative responses to both ‘rigidbody’ and ‘soft-bodies’

AXIS OF USER CONTROL - AUTOMATION

Movement, Shape

- Shadowgraphs and Computer Vision
- The Human Shadowgraph and Whole Body Interactions
- Boundary Representation / Edge Detection
- Object as Surface Detection
- Silhouettes as Computational Objects
- Objects as Markers
- Touch Techniques
- Auto Scenography - Image Processing
- Auto Generation of Scenic Elements
- Hands and Augmentation
- Translucency, Glow, Ensemble

Glow, lighting - Structured Environments Computer Vision

- concepts
- outline

Myron Kruger — so central — critters Robotic Performance

annotated concept map

annotated contact map. . .

computers simulation and imitation of older cultural forms computer simulation

and augmentation of older puppet related forms. . .

– GOALS / DATES JITTER - accidental movement design -

compound activity Andreas Gregersen and Torben Grodal in the Video Game

Reader 2

:”Another problem with the Wii-remote—and one that we find potentially more problematic for the technology’s ability to produce a robust sense of agency and

ownership—has to do with both the touch systems’ and the proprioceptive systems’ role in action. Physical force and force dynamics are central to our understanding of the physical world and thus, to a wide extent, our engagement with the world. A basic problem with . . . many game controllers is that true force feedback is impossible to implement in controllers of this kind, and . . . this yields a dissociation of sensory experience” (Gregersen and Torben, 2009, p.78)

Immersion through movement patterns. :”Merleau-Ponty writes that the body is ‘a system of possible actions’. This is a strong claim, and it seems rather obvious that even though we encounter many different action opportunities throughout our lives, our physical body does not change in many of these. As already mentioned, however, different situations change ‘the experience of our embodiment’. For instance, we feel a range of situations in an almost somatosensory modality, even though the nerve endings of the somatosensory system are not being stimulated.” (Gregersen and Torben, 2009, p.68) :”. . . we feel a clear sense of both agency and ownership with tool extensions that we are thoroughly familiar with” (Gregersen and Torben, 2009, p.68) :”Interactive computer art, however, can never exist only as software. The work must reach out into the world in some way to capture the human interactor’s input; the interactor must either make physical contact with a physical object or make movements within an articulated region of real space. And the work must project some sort of stimulus - sound, image, kinetic movement - back into the world for the audience to perceive.” (Saltz, 1997, p.117)

Synthetic Realism:

:”Achieving synthetic realism means attaining two goals: the simulation of codes of traditional cinematography and the simulation of the perceptual properties of real life objects and environments.” (Manovich, nodate)

traditional codes of cinematography

depth of field pov theatrical sense of perspective multi-planar but orthogonal and 2D - or 2.5DF

transitions, scene changes, mise-en-scene

1.4 THE AUGMENTED SILHOUETTE

Silhouettes in Computer Vision Techniques

Silhouettes in Computer Vision Techniques

There is a curious association between contemporary techniques in computer vision and the formal aesthetic qualities of human shadowgraphs, shadow puppets and other silhouette forms.

In order to calculate shapes and forms, in a most general way, computer vision techniques need to simplify a video image of the world by reducing colours (to grey-scale or black and white), ‘down-sampling’ the resolution of an image, or averaging areas of an image into more generalised, lower resolution zones of changing pixels. These grides of changing greyscale values can then be compared frame by frame (or to use the jargon - ‘differ’) evaluating the difference. This, effectively, is an automated process, where areas of contrast in an image are processed into images that resemble the silhouette or the shadowgraph.

In a number of projects, ShadowMonsters [DATE] by Phillip Worthington the most notably relevant to shadow play, and considered in the present chapter, the human shadowgraph is automatically augmented by computer generated eyes, teeth, hair and sounds. Semiotic elements of the silhouette especially those meaningful to the ‘figurative’ or ‘portrait’ [MEMO: Centrality of the EYES AND FACE as MARKERS OF IDENTITY] are recognised by computer vision and visually extended.

Although these formal similarities, the use of silhouettes, are possibly coincidental, the association of such computer generated images and the creation of digital shadow puppets is relatively common. When the work is taken into the performative realm, we have an interesting computationally responsive, body based discipline emerging.

Examples: in the historically significant work of Myron Kreuger (US) (Video-Place, Critters) and in recent examples the work of Phil Worthington (UK) (ShadowMonsters, 2003) and various projects by Golan Levin (2004-2010) [DETAILS] we see the silhouetted image:

1. being augmented by software processing;
2. creating a boundless performing object;
3. creating an expressive incorporation of the body within the context of virtual construct;
4. specifically in the case of Worthington, creating an expressive environment for storytelling and play;
5. operating in either:
 - a) (a) a computer simulation of real world (Newtonian?) physics or
 - b) (b) real-world physics;
6. the computational (or video analogue) silhouette is post processed in real-time,
7. computer processing facilitates expressive acts of control or manipulation by the performer/ digital puppeteer.

Each of these points (i-vii) will be elaborated.. [TODO] Notes (section 1.10)

Related New Media Work

Myron Krueger and VideoPlace

Philip Worthington's Shadow Monsters

Golan Levin's Messo Di Voce and Interstitial Space

Emerging Themes

1.5 PERFORMING OBJECTS

The silhouette is a fundamental object of interaction in contemporary HCI. The performing object is a looser, and frequently preferred, terminology for the puppet

Puppetry is commonly associated with a tendency to represent life and undue focus has been placed on the human, animal, leading to anthropomorphic and animistic approaches. John Bell's definition of the performing object:

Jurkowski's definition of the anthropocentric definition of a puppet aniconic - the absence of the graphic representation of gods (and in some cases human figures) the pathetic or anthropomorphic fallacy thing theatre

Game characters and game elements as performing objects – article: (Westecott, 2009, Westecott (2009))

Expressivity, Presence and Flow

PROBLEMS OF WRITING 'FLOW'

Writing about motion is a conceptual problem flow is an established concept and helps to describe immersion / involvement... the subjectivity and qualities of being absorbed (or not) in a task.

Performer expressive behaviour

CONCEPT - a model of "spontaneous to planned"

CONCEPT - the pre-expressive (performer preparedness, training, the habituated responses of the body

examples of practice (e.g. Jeff Han - drawing objects then animating - instantly) preparing a library of assets

Physics-based Animation

physical simulation physics engines

evaluation of different techniques

box2D, chipmunk, bullet, PhysX,

PRACTICAL TEST - switching animation and physical simulation... between

primary /secondary motion PROCESS - Speedy prototyping - [TODO - USE OF

UNITY3D] DEFINE - soft bodies DEFINE - rigid bodies DESCRIBE - aegia

physx engine (now owned by nvidia) http://developer.nvidia.com/object/physx_features.html#s

- design factors - multitouch interface
- primitive geometry
- arbitrary collision shapes.

Select work of Jean Baudrillard is an important theoretical starting point for the ideas explored in this chapter. Not the totality of his work but select concepts resonate with the sense of object, simulation and interactions with technology. Particularly, the theorisation of objects (Baudrillard, 2005 (1996, Baudrillard (2005 (1996))) and his definitions of the orders of simulacra (Baudrillard, 1994, Baudrillard (1994)):

“Three orders of simulacra:

simulacra that are natural, naturalist, founded on the image, on imitation and counterfeit, that are harmonious, optimistic, and that aim for the restitution or the ideal institution of nature made in God’s image;

simulacra that are productive, productivist, founded on energy, force, its materialization by the machine and in the whole system of production– a Promethean aim of a continuous globalization and expansion, of an indefinite liberation of energy

simulacra of simulation, founded on information, the model, the cybernetic game– total operationality, hyperreality, aim of total control.” (Baudrillard, 1994, p.121)On holograms,

“Three-dimensionality of the simulacra– why would the simulacra with three dimensions be closer to the real than the one with two dimensions?” (Baudrillard, 1994, p.107)

[UNPACK] Closer to the real- [UNPACK] aniconic / God’s image - observe the historic connection with Java / Malaysian shadow forms where a deity could only be seen to be represented by a shadow and not a physical form. [UNPACK] simulations that are productive could refer to those that generate emotion engagement, those that are used instrumentally as tools for expression. [UNPACK] energy, force - though only poetically connected, simulations of 3D worlds that attempt to conserve simulations of Newtonian physics mechanical / optical [UNPACK] [DEFINE] the cybernetic game and make reference to ‘total control’ - which is a significant part of the dynamic of the puppeteer.

[THOUGHT] There is a dialectical relationship between total control and the accidental expressivity of chaos;

Physical simulation in computer space is a broad and involved area. In the domain of digital puppetry, that can easily occupy a fused sense of how 3D spaces get ‘projected’ upon 2D surfaces, the simulation of Newtonian forces

:”In computer graphics we are given great freedom - we can develop scenes in which the fundamental laws of physics that we associate with our surroundings are followed or we can adjust, change and even disregard such laws. For example, in the case of animated images we need not adhere to Newton’s Laws of motion - we can create scenes in which action and reaction are not equal and opposite (however, the repercussions may be somewhat surprising...)” (Blundell, 2008, p.352)

Synchronous and Asynchronous Techniques

Multitouch and Expressive Gestures

1.6 EXPRESSIVE GESTURE AND INTERACTION

Responsivity

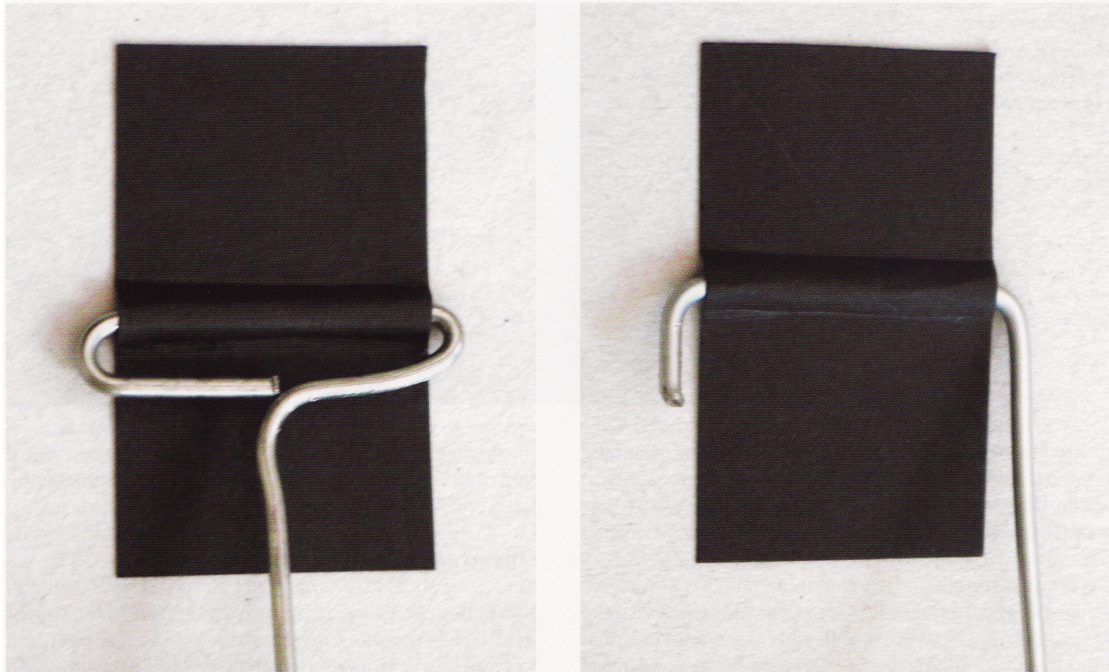
Automation and Control in Performance Animation

Multitouch

Multitouch Natural User Interface group [TODO make reference] Human computer interaction is on an interesting trajectory from command line input (CLI) (keyboards and screens), through graphic user interfaces (GUI) windows, mice, keyboards and the innovations from Xerox Parc, Microsoft, Apple and others, to ‘natural user interfaces’ (NUI). NUI are best characterised by their lack of mice and keyboards, and can describe classes of input ranging from mono, dual to multitouch surfaces, whole body interaction (through camera based interfaces), to eye-gaze control, and various classes of gestural interaction.

Elsewhere in the thesis, I consider other physical forms of interaction with different classes of Human Interface Devices (HIDs) as interfaces for digital puppetry, but the current chapter focuses on multi-touch.

Figure 1.1: Shadow puppet hinge 001 currell



Shadow puppetry and shadow puppet objects often have numerous points of ‘control’ in the form of rods connected in a variety of manners, allowing different angles and different degrees of freedom (DOF):

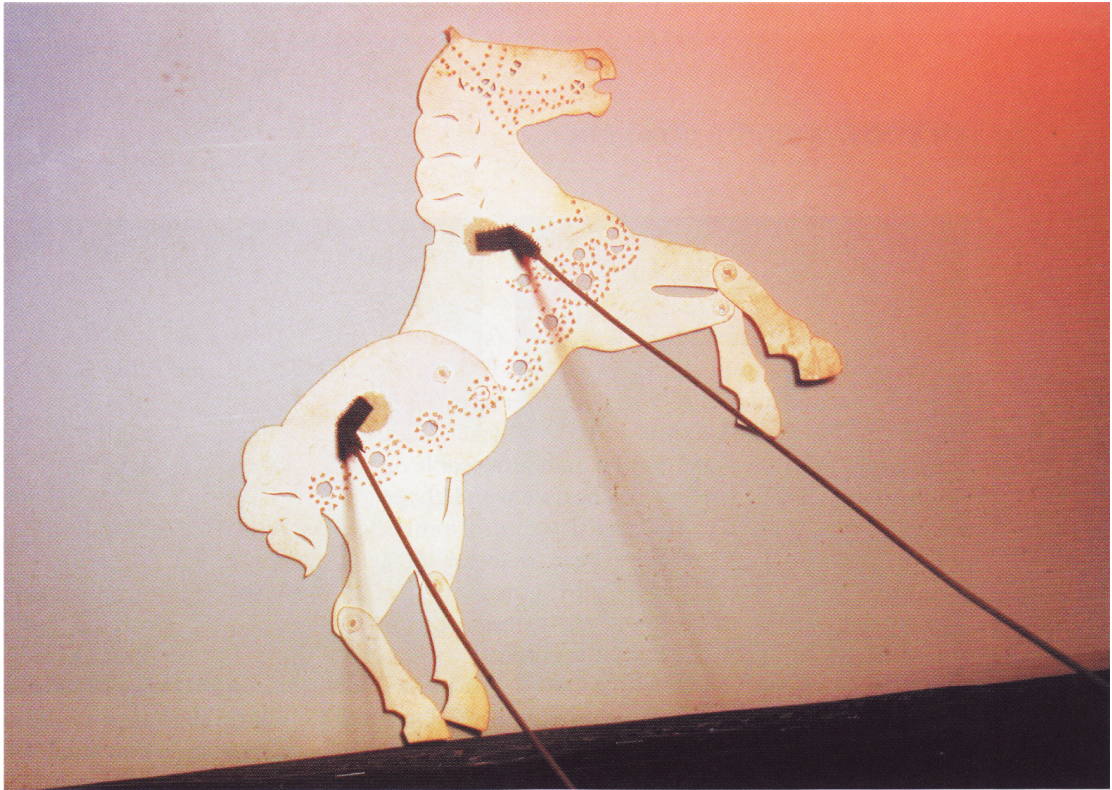
(i) fixed joints constrained to 180 degrees of movement on a plane fastened to either static flat forms or articulated parts of a figure. See Figure 1.1 and Figure 1.2 for a better visualisation of this design.

(ii) ‘Universal joints’ made from knotted cord allowing flexible directions of approach.

The rods are used to brace a puppet on a flat translucent screen, sometimes with a low ‘foot-board’ allowing the puppets to rest to a level. Animation happens by moving the rods, apply torque / rotation, lifting the rods to allow pendulous swing of connected bodies, or in some (exciting) cases the phenomenon of double-pendulous swing. A double pendulum hangs weighted objects around (at least) two pivot points and energies are stored, momentum spread through the connected bodies (in a more-or-less) chaotic way. Marionettes (string puppets) have similar properties.

(iii) Contra-movement of two rods can control the rotation around pivot points

Figure 1.2: Shadow puppet horse 001 Source: Currell



of fixed rigid bodies. Figure 1.2 is the simplest example of this style of articulation. Across world shadow traditions, there are different approaches to the quantity of articulation a shadow puppet design has. Wayang Kulit, the Indonesian shadow tradition has characters with articulated arms only (a shoulder, elbow and wrist joint). Greek Karagiozis often has a pivot at the torso, and one articulated arm but an arm made of a chain of up to ten pivoted pieces. Expressivity relates to the articulateness of a figure. But there is no easy correlation between the quantity of moving parts to the expressive potential of a figure. Gestural complexity increases with more moving parts, but control systems become more complex and the requisite ‘techne’

The basic proposition of the ShadowEngine v001 is to replace the control rods of a physical 2D shadow puppet with multiple touches of a performer (or multiple performers) transmitted by a touch interface.

Gestures, Flick, Pinch,
2D in 3D space...

1.7 ARTISANAL CRAFT IN THE DIGITAL AGE

Computers are seen as a preservation strategy for ancient craft and artisanal traditions... theatre of paper, paper cutting etc.

working with leather, dyes the anthropological contexts for puppetry root traditions in popular traditions

antipathy between contemporary technology and the demise of traditional practices... US puppeteer and scholar, Paul McPharlin had a phrase 'handicraft in the machine age'

how could artistic craftperson-ship survive in the age of mechanised manufacture

art, skill, knowledge, a reification of the puppet object... the act of modelling - sculpture the act of rigging and jointing - calibration for performance

An Emerging Project in Digital humanities

analysis and synthesis of modes of practice and understanding

publication computational analysis project design

archival and retrieval animation studies John Unsworth: discovering, annotating, comparing, referring, sampling, illustrating and representing. new approaches to studying the 'enduring problems' relating to existing cultural artefacts

Preservation and Heritage

Digitisation is central to contemporary processes of archival storage and information retrieval. For books, images and video, digital optical recognition and scanning is commonplace, the act of curating geometry and surface qualities and textures of 3D objects through digitisation is emerging MEMO:EXAMPLES. The use of portable 3D scanners to digitise heritage artefacts offers interesting models for the archiving of fragile material.

In PROJECT X, PROJECT Y and PROJECT Z, I explore the practicalities of digitising heritage shadow puppets. The projects go beyond simple interactive 3D models and present an approach where game technologies, physical simulations and tactile interactive strategies (multitouch surfaces) permit the user/performer

to animate in real-time articulated screen based figures.

Puppets and performing objects ‘live’ in expressive contexts. The ‘Shadow Engine’ software and setup allows kinetic objects to be chosen, operated, the interactive selection of scenographic elements Puppets should move and form the basis of play. The kinetic and experiential are a major component in the ‘recontextualisation’ of performing objects.

[MEMO] I wish to explore the Theatre and Performance Collections at the V&A: digitising sets, model theatres, puppets. utility of interaction in museums and heritage:

The heritage application of the techniques are secondary to an exploration of the ‘expressivity’ of virtual objects. This chapter:

- discusses and differentiates the author’s approach from similar work;
- documents the practical projects and creative process;
- deconstructs ideas of materiality and physical simulation (e.g. material properties transparency, translucency, gravity, spring, mass, collision)
- examines the act of ‘configuration’ and calibration as principles of puppet expressivity
- appraises glitch as evidence of digital spontaneity
- evaluates user-testing of multiple variations of the system

REVIEW OF PREVIOUS WORK
On spectacle, the ensemble of production and production design and relating contemporary digital art works, in formal terms, with precedents.

“... forms of visual digital culture ... share something of the same cultural space with an earlier tradition of popular entertainments. What they are doing in terms of aesthetic practice bears direct comparison with prior forms of popular entertainment that operated with the same overall principles.” (Darley, 2000, p.56)

marvels NOTES practically engaging with, enabling play with vulnerable artefacts.

1.8 DOCUMENTATION OF PRACTICE

This section is written in a more informal tone and contains details that will be edited.

In terms of practice, that I am writing up in the chapter: I have the first version of my multiTouch iPad application currently called the “ShadowEngine”.

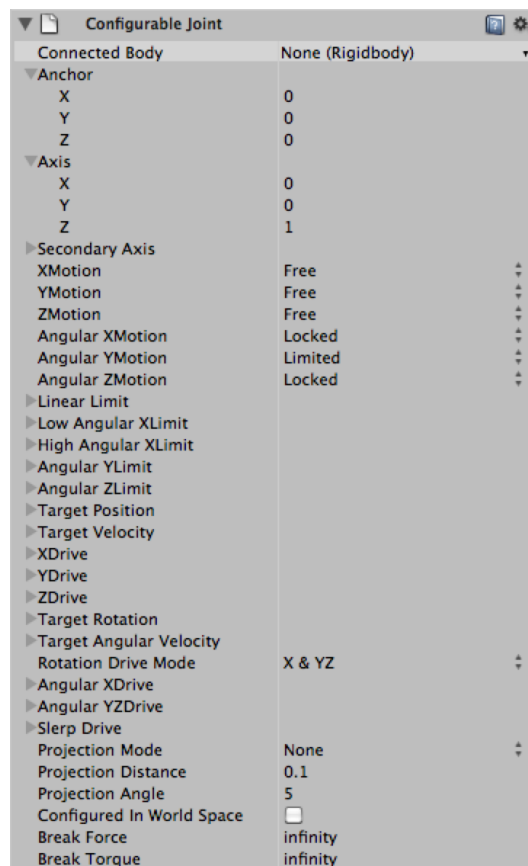
It’s been a very involved process, with lots of learning and experimentation to establish the most effective way to do it and make it work in a playful way:

This involved:

(i) designing or capturing images of shadow puppets and silhouettes, scenography etc (ii) creating 3D models of them (kind of 2D with a little cardboard like depth) - with each shadow puppet part a separate sub-object (iii) texturing them (iv) taking the 3D model into a game engine: creating a physics simulation of them as ‘rigidbodies’, applying ‘joints’ and ‘hinges’ - totally configurable joint properties that control angular and motion constraints, friction, drag, mass, spring, torque, physical properties etc. This act of configuration is a major moment in exploring and configuring the ‘expressivity’ of the object (as is (i)) (v) programming the application flow, interactions and control logic. Mouse control (on the desktop version) is working lovely and it’s quite good fun to play with. Multitouch control on the iPad surface is working but needs a lot of further refinement and improvement. The objects often glitch and go out of control - very expressive!

Lots of things to do and experiment with: I need to make some ‘non-figurative’ objects to play with as well as the figures. And need some ‘softbodies’. I’d like to work on scenography, transitions, lighting effects and other mise en scene elements. I need to explore context / storytelling and extra-textual things beyond the object (there is a wider context for theatrical expressivity and the puppet is just one weird semiotic component in that). I have an idea to capture instant silhouettes of the people operating the figures and incorporate them as figures in the game world

Figure 1.3: Unity3D ConfigurableJoint interface



(hence why I wished for a profile image of you [leslie]) - this could be really good fun for the seminar week. If you could get me a few profiles of other smartlabbers, that could be very entertaining!

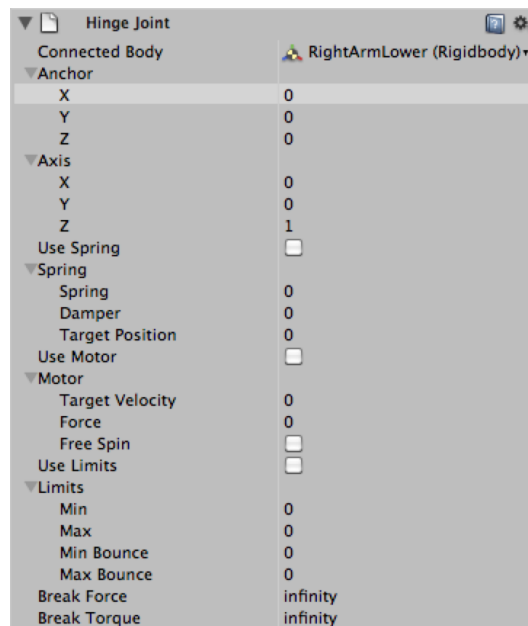
Loads of ideas have occurred to me doing the work: including a desire to approach the Little Angel, and/or the V&A for their theatre / puppet collection, scan some material and turn them into 'playable' digital characters, a kind of archival / education artefact - allowing us to play and 'express' with fragile objects... Designing and working a show is possible, but the touch based control techniques are more or less ready to test in controlled ways (e.g. have one group use monotouch (i.e. mouse control) and another multitouch and video the response and collate qualitative audience feedback)

[IMAGES]

[the app icon]

[the 'app' on the iPad]

Figure 1.4: Unity3D Hinge interface



[animating under the influence of virtual gravity]

[a response to my touch]

[not the horse whisperer, the horse tickler]

[moving a greek karaghiozis figure [source images from Spatharis, an important Greek shadow puppeteer]

[a non-realtime render of a jointed Greek shadow creature / character, with coloured shadows (using involved rendering techniques) [source puppet from Spatharis, an prominent Greek shadow puppeteer] - I haven't made this one playable yet]

[visualisation of the physics simulation [and double pendulum like behaviour] of a complex multijointed character]

[another visualisation of the physics simulation post flick - the design style of this puppet is dominated by the long multi-jointed arm (holding the gun) - you can see it's physics produced bending, kinking and secondary motion]

Figure 1.5: Unity3D Interfaced With Joints Visualised

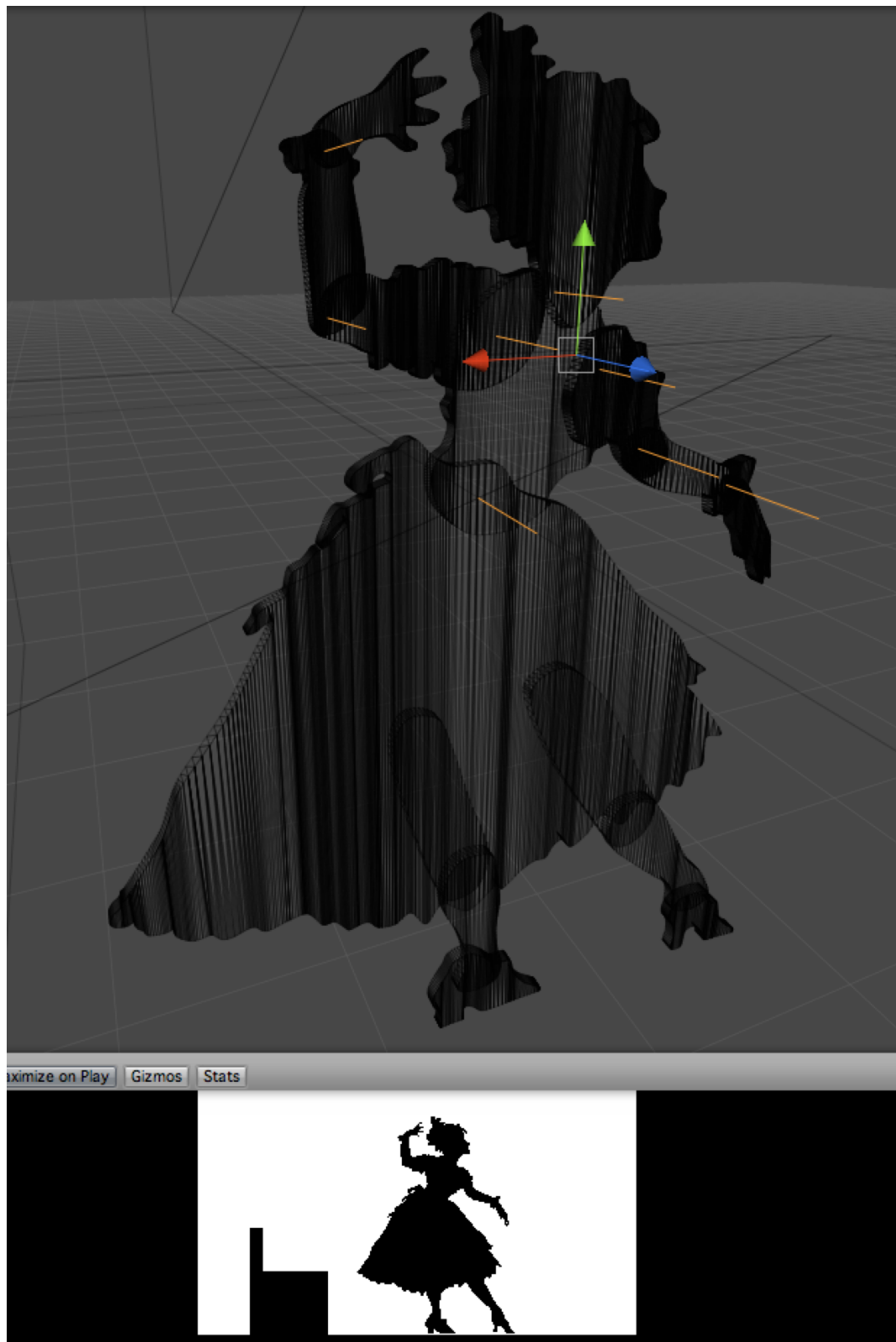


Figure 1.6: Unity3D Rigidbody interface

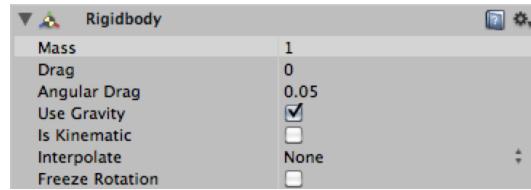


Figure 1.7: ShadowEngine Icon



Figure 1.8: Shadow engine001 on the ipad



Figure 1.9: Shadow engine001 lotte figure



Figure 1.10: Shadow engine001 lotte figure touched



Figure 1.11: Shadow engine001 horse prodded



Figure 1.12: Shadow engine001 Kara ipad touch photo



Process: Designing the Multitouch ShadowEngine**Process: Custom Software and Middleware****Rapid Prototyping: Using Unity 3D**

an integrated 3D authoring tool, middleware, a game engine

At the outset of the project, I had a desire to completely roll my own software
3D model import Texturing and lighting control

Integrated Physics In world sound and audio interaction handling (single point
of contact (mouse control) or multitouch GUI

Just an evaluation of physics libraries, (and there are some delightful, seductive,
samples for the digital puppeteer) - most if not all, required the programmer to
author a whole rendering pipeline, in order to use custom graphics, textures, or
models.

OGRE As the focus of the these is how digital puppets are expressive and enable
expressive play, I needed a more agile, rapid approach to solving software related
tasks Prototype

Software Scope and Design**Annotated Images**

In the following figure, Figure 1.13 we can see some visual characteristics of the
'pre-rendered' non-realtime generated image. Taking over four minutes to gener-
ate a frame (granted on an old laptop), USE photon mapping, 'radiosity' or global
illumination (where the colour characteristics of bounced or 'secondary rays' are
simulated - showing washes of colour in shadows), , sub-surface scattering, surface
properties affecting translucency

RIDICULOUS (but fun) approach. I set up a simulated scene where a powerful
virtual light shines through a puppet shaped mesh, with translucency enabled,
where it's shadow is virtually projected onto a semi translucent screen object. I
positioned the scene camera on the reverse side and see if we can see the 'shadow'
colours through the layers of objects.

REMEMBER PROJECT - to create responsive real-time virtual objects people

Figure 1.13: Digital Rendering of Dragon Puppet from the Greek Karaghiozis Shadow Tradition



Figure 1.14: iPad Physics ShadowEngine Test 001: Karaghiozis Leaping



can play with

In the following, Figure 1.14, we see an object under the control of multi-touch...

Testing and Evaluation: Expressive Shadows

1.9 FUTURE SOFTWARE DEVELOPMENTS AND IDEAS

A brainstormed list of future (some planned) developments:

In performance, combine projected shadow play with actual silhouettes co-present on the same screen.

Combine computer generated augmentations with touch controlled silhouettes, like a feedback loop. Pass the video output of one process into the computer vision / augmentation environment.

Develop the UI for sceneography and character selection.

Develop the UI for transitions and other cinematic effects.

Like above, develop the UI for 'sequencing'

Figure 1.15: iPad Physics ShadowEngine Test 002: Complex Multi-Jointed Figure (Horse) Leaping. Source: Ian Grant's ShadowEngine v001



Figure 1.16: Jeff Han's Silhouette Projects 001. Source: [TBC].



Figure 1.17: Jeff Han's Silhouette Projects 002. Source: [TBC].



Figure 1.18: Jeff Han's Silhouette Projects 003. Source: [TBC].

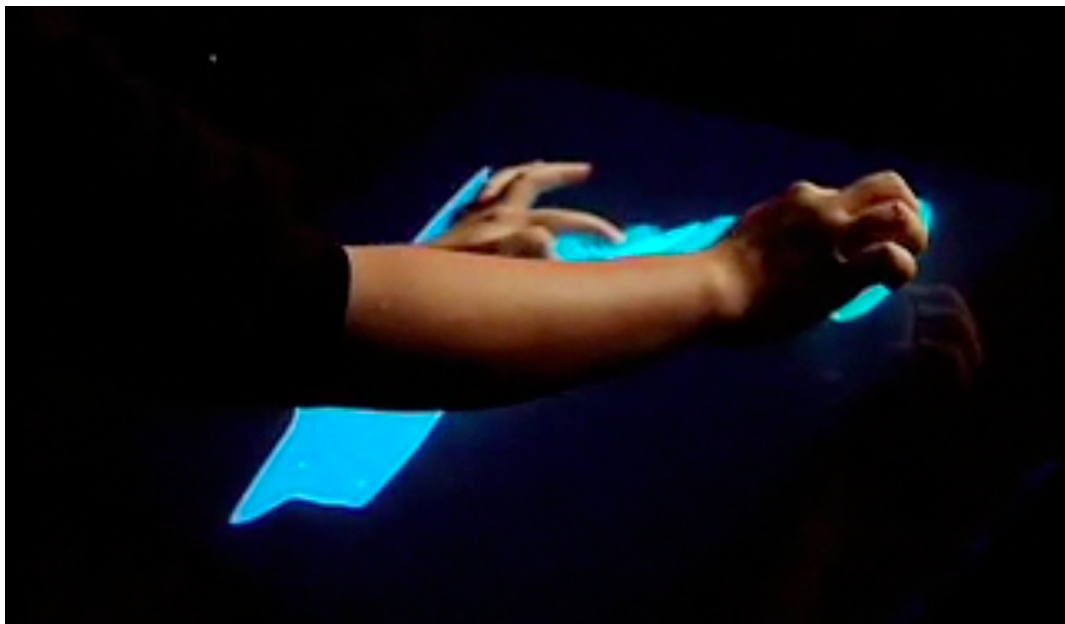
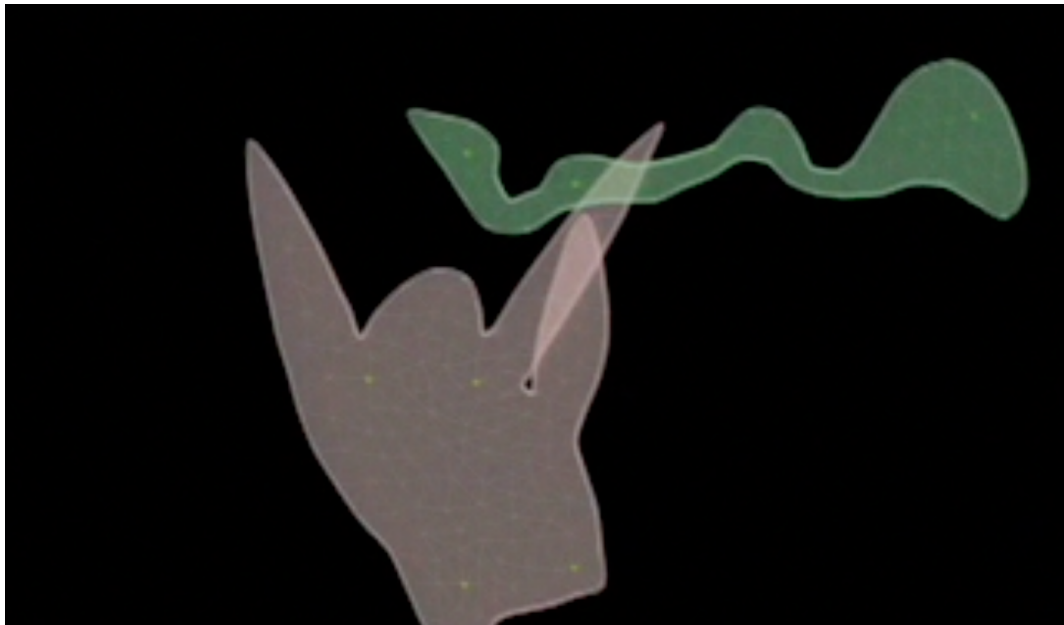


Figure 1.19: Jeff Han's Silhouette Projects 004. Source: [TBC].



Other cinematic effects include: Use the same middleware to develop touch interactions with soft bodies;

Explore the expressivity of non-figurative objects and shapes;

1.10 CHAPTER NOTES

Digital Silhouettes: Shadow Puppetry

An Evaluation of Interactive Techniques for Shadows Play with Light and Shadows (Schonewolf)

Check: <http://www.cabinetmagazine.org/issues/24/Warner.php>

Quotations and Notes - Currell

:"A shadow is an image cast by an object intercepting or impeding the light or the comparative darkness formed when such an object causes a difference in the intensity of light on any surface. A shadow, however, does not have a separate existence by depends for its existence but depends for its existence, its nature and its form upon the source of light that creates it and the surface upon which it is cast." (Currell, 2007, p.7)

Do justice to the outline from David Currell

Quotations and Notes - Digital Work

Quotations and Notes - Cubitt

On retro-engineering / remaking the hardware to re-configure artistic and creative practice and the evolving of the ‘apparatus of making’

“No single artwork, however luminous, however achieved, however passionate, carries in itself the purpose or function of the electronic media arts as a new cultural domain. The achievement of such a practice is to create the terms under which the apparatus of making is constantly re-evolved.” (Cubitt, 1998, p.145)

Exploration of new subjectivities blocked by the limits of existing designs.

Tropes in existing designs. On Amateurism: unrecognised cultures, homespun cosmologies. It is its own legitimate activity in a tradition of the underground (Cubitt, 1998)

[summarised from][p.144]

On digital appropriation: “a celebration of the syncretism and hybridity per se, if not articulated in conjunction with questions of hegemony and neo-colonial power relations, runs a risk of appearing to sanctify the *fait accompli* of colonial violence” (Cubitt, 1998)

[Shohat cited in][p.144]

“The hierarchies of multimedia design have prioritised certain elements of the body – eyes, ears, hands – over others, distracting and disassembling the body in the interests of coherence now centred outside the body, in a pure communication between mind and object.” (Cubitt, 1998, p.151)

Glossary: Heterotopia - a plurality of forms and practices Chapter - Virtual Realism

about train windows / journeys the picturesque is proto-cinematic 30

‘every visualisation is a symbol system’ 31

Baudrillard - materiality and the virtual

Heim - Six technical definitions of the virtual the appearance of simulated 3D space on 2D monitors interaction with electronic representations immersion in hard- and software environments telepresence 'full body immersion' immersive networked communications

Jaron Lanier's RB2 - reality built for two

"... proponents of virtuality like Lanier or Myron C. Krueger (1991) embrace Baudrillard's culture of artifice." (Cubitt, 1998, p.32)

perception - clarity and renewal optical / psychological 'the machine ensemble'
30

The presence of 'humanity', the humane. Co-presence of the image and the creator of the image.

A PULSE - a RHYTHM - disembodiment and recorporealisation 32

Study of Perception - (Marr, 1982)

peripheral movements registering objective depth

Ponty mentioned (Merleau-Ponty, 2002)

(Sobchack, 1997)

about analogue / computer films of John Whitney Youngblood cited in (Cubitt, 1998, p.37) 'Kinaesthetic and optical dynamism'

abstraction / expression 'dispersal', randomness, the decay of meaning

Jargon - 'remaking the apparatus'

Eisenstein - 'overtone montage'

"the interlinking of thematics across the whole film through associations of composition, motif, rhythm and sound that would articulate the shots in ever more complex webworks of interrelation." (Cubitt, 1998, p.44)

Chapter - Spatial Effects

'perspective as special effect' 74

(George, 1990) cartoons and spatial characteristics

“The central techniques of the classical cinema – pan, tilt, zoom, dolly, track – appear absurd to Méliès, master of the fixed camera and the focal length. The answer is, of course, that the ‘contemporary views’ of the late 1920s were no more natural than Méliès’s grotesques: we have long since abandoned nature. What the mobile camera and editing techniques have provided is a new mobility for the audience, filling the perspectival space between the screen and the disembodied eye of contemplation.” (Cubitt, 1998, p.78)

‘Such mobility is the secret of perspective as special effect.’ (Cubitt, 1998, p.78)

Navigation Smoothness diegetic depth of field and actual surface (George, 1990)

79 cut (jump cut) seamless space for exploration

the modelled playworld

emulation

software handles the ‘consistency of spatial representation’

Computer animation compared with hand drawn animation and the pursuit of verisimilitude.

“for the algorithmists, the engineering is inseparable from the art”
(Cubitt, 1998, p.82)

“The VDU is a grid, every pixel identifiable as a numerical address, and its states likewise encoded. This grid derives its onscreen presentations from modernist design practice, which itself can be traced back to Descartes’s invention of a neutral space defined only by coordinates rather than contents. . . . But behind this insipid, unmarked space can be glimpsed an older grid deployed in the mediaeval scriptoria, a grid made up not of modular, transferable boxes, but of points and cruxes, in each of which the divine and the sublunary met.” (Cubitt, 1998, p.89)

Quotations and Notes - Baudrillard

: “Each of our practical objects is related to one or more structural elements, but at the same time they are all in perpetual flight from technical structure towards their secondary meanings, from the technological system to the cultural system.”

(), 2005 (1996, p.6)

the industrial to the craft object

the useless object, the gadget (French trans. lays stress on gadget as novelty item with no function or use value

the personalisation of objects

perceptual materiality automatism - perfection and making automatic:

“When [an object] becomes automatic, its function is fulfilled.” (),
2005 (1996, p.118)

“Because the automated object ‘works by itself’, its resemblance to the autonomous human being is unmistakable... . We are in the presence of a new anthropomorphism. ... it is no longer his [sic.] gestures, his energy, his needs and the image of his body that man projects into automated objects, but instead the autonomy of his consciousness, his power of control, his own individual nature, his personhood.” (), 2005 (1996, p.120)

obsessive manipulation and contemplation (), 2005 (1996, p.122)

“Like all obsessions, this particular variety [of aesthetic object] has its poetic side, as manifested to a greater or lesser degree in Pacabia’s machines, in Tinguely’s mechanical constructions, in the simple clockwork of a discarded watch, or in any object whose original use we simply cannot remember but whose mechanism still arouses a sort of delighted fascination in us. Something that serves no purpose whatsoever may in this sense still serve us” (), 2005 (1996, p.122-123)

an aesthetic approach – subjectively functional (obsessional) omits function and becomes concerned with an exaltation of ‘pure mechanism’.

“No sooner does an object lose its concrete practical aspect than it is transferred to the realm of mental practices. In short, behind every real object is a dream object.” (), 2005 (1996, p.126)

“Modes of the imaginary follow modes of technological evolution, and it is therefore to be expected that the next mode of technical efficiency will give rise to a new imaginary mode. At present its traits are difficult to discern, in the wake of the animistic and energetic modes, we shall need to turn our attention to the structures of a cybernetic imaginary mode... .” (), 2005 (1996, p.127)

“The current fashion for happenings' has brought the great science-fiction event of the suicide' or murder of the object a little closer to home. The happening involves an orgiastic destruction and debasement of objects, a veritable hecatomb whereby our whole satiated culture revels in its own degradation and death.” (), 2005 (1996, p.132)

To digress: the first video of an iPad bought and instantly destroyed found it's way onto YouTube - [find DATE].

Discuss GLITCH, the emotion / responsive reactions of playing with objects also under the control of the simulation of physics. BROKEN, CRUELTY, CONTROL. The psychodynamics of controlling expressive objects. Autonomy - out of control. . .

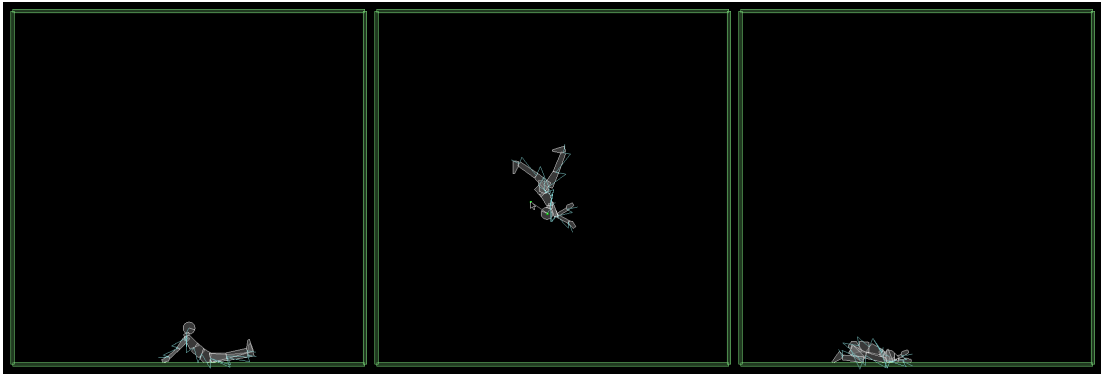
Quotations and Notes - Kozel

On violence:

On her disembodied and immaterial experiences performing in Paul Sermon's 'Telematic Dreaming', Susan Kozel writes:

“Someone elbowed me hard in the stomach and I doubled over, wondering why since I didn't actually feel it. . . . The famous claim with virtual technology is that the body is obsolete, replaced by an

Figure 1.20: Expressive Box2D RagDoll Empathy all



infinitely enhanced electronic construct. If this is so, then why did nastiness or violence enacted on my image hurt? How could the body be irrelevant yet still exert a basic visceral control over my movement?” (Kozel, 2007, p.97)

the figurative, the cruel, the accidental contortion

Earlier tests of interactions with antro digital puppetry like interactions with Terminology: performance animation

On motion capture - critique of the term. Mentions key thinkers / practitioners Brad DeGraf and Emre Yilmaz SPONTANEITY / IMPRO DEFINITION

“Performance animation is a new kind of jazz. Also known as digital puppetry or motion capture, it brings characters to life, i.e. ‘animates’ them, through real-time control of three-dimensional computer renderings, enabled by fast graphics computers, live motion sampling and smart software. It combines the qualities of puppetry, live action, stop motion animation, game intelligence and other forms into an entirely new medium.” (deGraf and Yilmaz, 1999, p.34)

On input devices and the presence of the silhouette in performance training:

“What input devices one needs, what kind of performer one needs, the performer-to-character mapping and direction, all crucially affect the results. This is where a lot of our expertise and experience lies. While this is rather different from the set of skills required to be a good

Figure 1.21: Expressive BulletPhysics Creature Empathy all

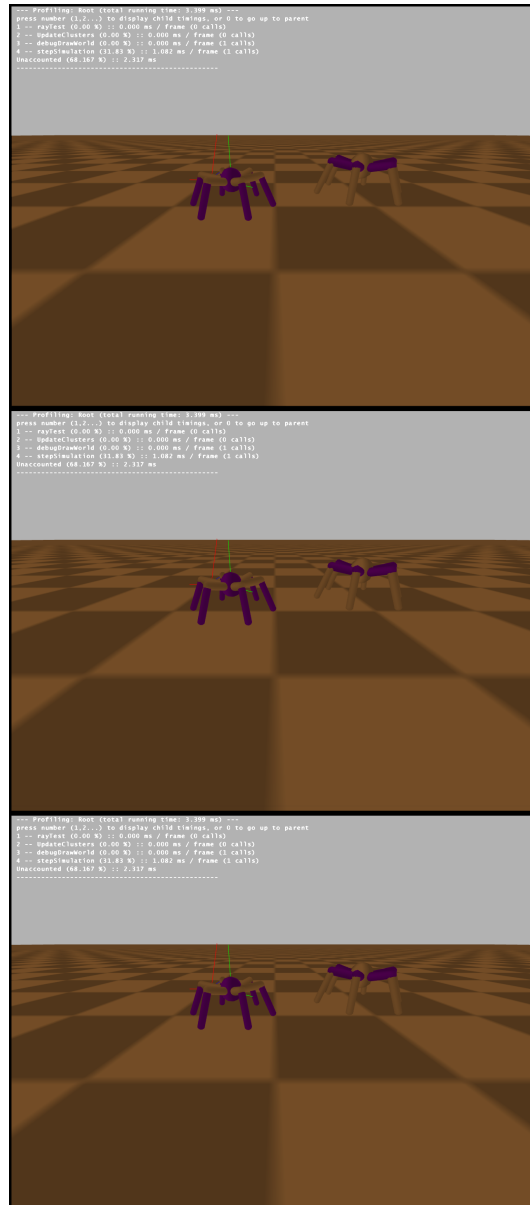
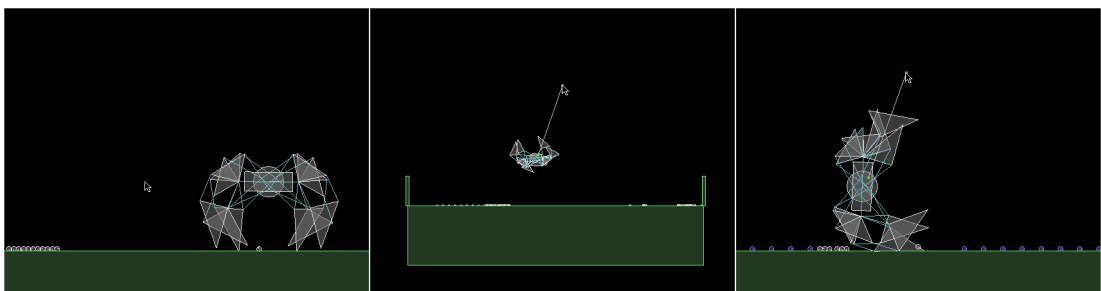


Figure 1.22: Expressive Box2D Creature Empathy 001 all



keyframe animator, it is similar in that it also requires sensitivity to the character, its personality, and what kinds of movements will look good on the design. For instance, trying to get the performance to read in silhouette has been a puppetry training method even longer than it's been a rule of thumb for animation." (deGraf and Yilmaz, 1999, p.35)

procedural animation

"It's becoming fairly common among animators to use expressions and procedural animation to take care of a lot of the work. This is a particularly rich area of exploration. For instance, in animating a dinosaur, it's possible to write expressions that open its claw-foot as it's about to land on a surface, and to close the claw-foot again as it's raised. Then the animator only has to take care of foot positions; the toes are computed automatically. Similarly, writing expressions to control a number of low-level features from one high-level attribute makes for much richer characters than could otherwise be practically controlled. The extremes to which this can be taken, and the particular utility of these methods in performance animation, are not so well known. When you're trying to perform everything live, the more motion you can derive, or get 'for free', the better." (deGraf and Yilmaz, 1999, p.35)

Automatic blinking, breathing hand gestures, locomotion, reflex, intention – rich expressive qualities.

Kozel: segues from discussing puppetry, the digital form and performance animation to discussing the classic essay on marionette theatre by Henrich Von Kleist. Location of the soul at the centre of gravity; pure flow of movement a physical phenomenon

anthropomorphism and anthropocentrism (e.g. human centric data / motion capture).the order of objectthe order of subjectdouble-belongingness

“Animism . . . if we define it as the attribution of life, consciousness, or spirit to the nonliving, it takes us beyond the familiar contours of the human form.” (Kozel, 2007, p.224)

“Puppetry is the sister art of performance animation, akin to alchemical practice, with a long history of transforming wood, cloth, and string into human, animal, or fantastical beings.” (Kozel, 2007, p.221)

Kozel issues an interesting warning:

“If performance animation becomes, in some narrow sense, performance animism, one would hope that we are not just mapping a narrow notion of humanity onto our digital creations. Strategic and creative animism can help avoid the dual grasps of anthropocentrism and technocentrism pervading our Western industrial societies.” (Kozel, 2007, p.TODO: FIND PAGE)

dynamic simulation

“Real puppets often incorporate a lot of `secondary motion`' into the design. Long fur or hair that drags behind a motion, or arms that dangle and swing, can add life to a puppet. Even a puppet that's only going to have one hand controlling it, and thus not a lot of direct control, can get a lot of `offree`' motion from physics this way. We can use similar tricks with our digital puppets. Max Rodentae is a peppy little rodent character we built for the Virtual Ed Sullivan Show on UPN (1998). His performance is supplemented with a number of dynamic simulations - that is, simulating the physics of masses, springs, gravity and other forces. His tail, ears and belly are all controlled this way. It gives him a lot of nice secondary motion, and adds a sense of weight and believability. The result is a floppy, fun character whose whole body is expressive,

and who doesn't betray the human inside." (deGraf and Yilmaz, 1999, p.37)

Check out: "Real Gestures, Virtual Environments" Sally Jane Norman. Institut International de la Marionette, Charleville-Mézières, France and ZKM.

Quotations and Notes - Tillis

: "The power of the puppet as a metaphor is an implicit confirmation of the idea that double-vision is the central process to the puppet. In much puppetry ... the operator and/or speaker is not present on-stage, and yet the puppet is perceived to be an intentional creation subjected to intentional control. Even when the puppet is presented in the most imitative manner possible, it is perceived by its audience to be an object" (Tillis, 1992, p.159)

cosmological / mystical level

lots of stuff peppered through the book:

"There are people who weep, are sad and aroused watching puppets, though they know they are merely carved pieces of leather manipulated and made to speak. These people are like men [sic.] who, thirsting for sensuous pleasures, live in a world of illusion; they do not realize the magic of hallucinations they see are not real." (Tillis, 1992)

[court poet of King Airlangga Java (AD 1035-1049) cited in][p.6] the designed figure, the envoiced figure, the kinetic figure

double vision - "an audience sees the puppet in two ways at one time: as a perceived object and as an imagined life." (Tillis, 1992, p.7) cross cultural observation and analysis of

phenomenon of the puppet: cross contexts, technical, performative, aesthetic, illusory, kinetic. theoretical problems of the puppet: issues of definition: 'how is the puppet to be defined; or, what is to be considered a puppet?' (Tillis, 1992, p.7) descriptions and taxonomies; metaphoric use of the term 'puppet'.

the puppet

“Contemporary puppet theatre is a rich and differentiated totality, taking in cultural elements of different provenance and from different epochs. (Jurkowski, 1988, p.62)

a synchronic study of the puppet may reveal insights about the ‘means of expression’ of the puppet.

“We must not forget how many people think [puppetry] is not worth taking seriously, that those who study it are wasting their time.” (Obstratov cited in Tillis, 1992, p.6)

Practice Notes

Plexiglass Sources

Rear Projection <http://www.plexiglas-shop.com/GB/en/sheet/plexiglas-rp-7qve7vsnwdc.htm>
xtuio nui touch monitor drivers

unity 3D iphone and ipad Check out new prof: Research Prof Peter McOwan
<http://www.dcs.qmul.ac.uk/researchgp/vision/>

Additional Notes

media development for cultural learning

the recontextualisation of artifacts in museums

a call “New kinds of creativity synergising old and new media”

“Approaches like these, which link ‘exotic’ cultural resources with the scholarly and industrial pursuits of technologised modernity, should be encouraged by the proponents of new cultural policy, and tied into media development projects. These original visions of ancient cultures through new technologies appear all the more valuable in that they creatively challenge positions adopted by certain institutions which consider themselves the sole and rightful interpreters of ‘True Culture’. Yet one of the strengths of digital data is precisely its aptitude for integration into an infinite variety of works, conveying multiple interpretations and visions.” (Norman, 1998, Norman (1998))

Project to articulate problems across a number of domains relating to motions capture and collaborative problem solving...

reworking motion capture.(Norman, Blackwell, Warren and Woolford, 2010, Norman et al. (2010))complexity of vision and touch (Merleau-Ponty

“Videoplace, Krueger’s interactive platform, marks a further and, in some sense, ultimate, stage in the restoration of autonomy to the responsive environment, understood as encompassing ... the embodied visitor. Videoplace works by capturing an image of the visitor’s movement, only in this case the image presents the outline of the visitor’s body processed (and distorted in various ways) by the computer.” (Hansen, 2006, p.35)

a technical and aesthetic accomplishment – action-response synchronicity

“On account of the synchronicity [of the movement of the video image] with the movement of the [visitor’s] body it is no longer a question of distinguishing between the activity of the system and the activity of the visitor. The computer system’s role as interaction partner fades into the background, and it now makes itself available as an instrument for the visitor to use.” (Hansen, 2006)

[Dinkla cited in][p.36]

Chapter Notes Kozel

Concepts from Susan Kozel: modes of improvisation kinaesthetically diverse - physically articulate (or expressive)

techne / technique An anecdote: John Roberts, a UK based marionettist / puppeteer, uses a twenty string chinese marionette

the expression engine [CONTACT MEDIA MOLECULE] [PROPOSE MERL PROJECT USING LITTLE BIG PLANET]

What is a ‘poetics of responsivity’? responsivity rather than interactivity... – in my case, the physical simulation puts in place a chain of action and response.. (CONTACT IMPRO) [Concept] hyper-reflectivity To use some terminology from

the extremely useful and perceptive work “Closer” by Susan Kozel (Kozel, 2007, (2007))

When a puppeteer performs, there is an acute sense of disembodied ‘hyper-reflectivity’. The focus and control of operation has during the moments of operation body-segmentation In early television puppetry (as devised by Jim Henson and others), the puppeteer often worked with puppets held aloft, while they observed the camera view of their arms, on a low level / eye level monitor.

WHAT HAPPENS TO THE PUPPETEER / PERFORMER Diagram: of ‘responsivity’, drawn from Merleau-Ponty (1968 [check]), Deleuze (1992 [check]) and Schwartz (1992 [check])

:”Merleau-Ponty seems to hold sacred the form of the human body, while Deleuze disintegrates it into forces, planes, and directions.” (Kozel, 2007, p.185)

‘Deleuzian non-bodies’

In describing a digital / motion capturing glitch:

:”Another evocative moment with a malfunctioning system occurred when I stepped over the sphere (which rested on the floor) and the figure I was animating stretched and then inverted, the shift in my position having scrambled the data. Responsivity can occur while the system is malfunctioning. . . . ” (Kozel, 2007, p.188)

Kozel refers to Morse frequently: Here’s Morse:

“awareness of mediation and its sensory material of expression”
(Morse, 2003, online)

“Whatever it may be in the larger socioeconomic and cultural sphere, artists have chosen to inflect prosaic interactivity to their own expressive ends. Metainteractive aesthetic strategies—like poetry, with its rhythms, assonances, and figures—does not merely transport us to another scene or world but is itself an experience charged by semantic and formal values of expression. Interactivity is not just an instrument or a perhaps irritating interval between clicking and getting somewhere else but an event that brings corporeal and cognitive awareness to this

increasingly ubiquitous feature of the contemporary world.” (Morse, 2003, online)

it is like playing catch. flick, artefact response and response - a game with gravity.

“The limbs, which are only pendulums, then follow mechanically of their own accord, without further help. He added that this movement is very simple. When the centre of gravity is moved in a straight line, the limbs describe curves. Often shaken in a purely haphazard way, the puppet falls into a kind of rhythmic movement which resembles dance.” (Von Kleist, 1994, PAGE NUMBER)

“The line the centre of gravity has to follow is indeed very simple, and in most cases, he believed, straight. When it is curved, the law of its curvature seems to be at the least of the first and at the most of the second order. Even in the latter case the line is only elliptical, a form of movement natural to the human body because of the joints, so this hardly demands any great skill from the operator. But, seen from another point of view, this line could be something very mysterious. It is nothing other than the path taken by the soul of the dancer. He doubted if this could be found unless the operator can transpose himself into the centre of gravity of the marionette. In other words, the operator dances.” (Von Kleist, 1994, PAGE NUMBER)

“I said the operator’s part in the business had been represented to me as something which can be done entirely without feeling - rather like turning the handle of a barrel-organ.

‘Not at all’, he said. ‘In fact, there’s a subtle relationship between the movements of his fingers and the movements of the puppets attached to them, something like the relationship between numbers and their logarithms or between asymptote and hyperbola.’” (Von Kleist, 1994, PAGE NUMBER)

Figure 1.23: Levin's Silhouette Projects 001. Source: [TBC].



Notes on Krueger VideoPlace and Levin

Interactive Art / Shadowgraphs

FROM YOU TUBE:

“The ‘Interstitial Fragment Processor’ (2007: Golan Levin) is an interactive artwork which allows visitors to explore the audiovisual potentials of negative spaces. The installation collects and drops the contoured shapes formed within and between the bodies of its participants. Elastic red and blue animated objects plummet toward the gallery floor, producing audiovisual improvisations on vertical descent and collision. Available from bitforms gallery, NYC.”

DESC FROM YOU TUBE

“Messa di Voce (2003: Golan Levin, Zachary Lieberman, Jaap Blonk, and Joan La Barbara) augments the speech, shouts and songs produced by a pair of virtuoso vocalists with real-time interactive visualizations. The project touches on themes of abstract communication, synaesthetic relationships, cartoon language, and writing and scoring systems, within the context of a sophisticated, playful, and virtuosic

Figure 1.24: Levin's Silhouette Projects 002. Source: [TBC].



audiovisual narrative. Custom software transforms every vocal nuance into correspondingly complex, subtly differentiated and highly expressive graphics. *Messa di Voce* lies at an intersection of human and technological performance extremes, melding the unpredictable spontaneity and extended vocal techniques of human improvisers with the latest in computer vision and speech analysis technologies. Utterly wordless, yet profoundly verbal, *Messa di Voce* is designed to provoke questions about the meaning and effects of speech sounds, speech acts, and the immersive environment of language.”

“Imagine becoming your own shadow and to being able to interact with other peoples shadows in a simulated space – to touch them and be touched. Kreugers aim is to create us such a shadow world where people can relate to each other in a way quite impossible in the physical realm.” [anonymous narrator speaking on VideoPlace in Myron Krueger clip]

“It is as if evolution has prepared us for seeing ourselves on television screens combined with computer images but all, one of the main

Figure 1.25: Levin's Silhouette Projects 003. Source: [TBC].



Figure 1.26: Kreuger's VideoSpace 002. Source: [TBC].



Figure 1.27: Kreuger's VideoSpace 001. Source: [TBC].



attractions is the juxtaposition of large and small. So that two people are now interacting and, to some extent discover what the possibilities are and what is suggested emotionally by scale.” [Myron Krueger in you tube clip]

“Each participant’s video image is digitised and is fed to a series of specialist processors that analyses the resulting silhouettes. These processors analyse each image in isolation (e.g. posture, rate of movement) and with respect to graphic objects and live images on the screen. . . . When the participant’s actions are understood by the specialised processors, they are reported to the executive processor that decides what the responses should be. Depending on the participant’s behaviour, it can move an object, change that objects colour, move the participant’s image, or make a sound ” (Krueger, 1991, p.44-45)

Krueger et. at. [MEMO list others] designed nearly fifty interactions (or compositions), each playing with the interaction of silhouettes of differing scales, with

objects and interventions from other (often distant) spaces. At once telematic and performative, the system became a technological and aesthetic base-line for future computer vision and art installation based systems.

Notes

Myron Kruger Shadows are an intriguing computational phenomena and, in an art context, have been the focus of several recent computer graphics papers, [TODO SIGGRAPH, SIGGRAPH Asia]. Performative and puppetry contexts have been considered and technically simulated. But most studies stop short of becoming a tool for expression and performance.

The present thesis is aiming to evaluate the full extent of contexts where digital puppetry is presented. This study includes contexts where the performative and puppeteering contexts of control are secondary to the visual and semiotic ones.

The current chapter focuses on the theme of the silhouette and shadow puppet.

There is a lot in:

(Ren, Shakhnarovich, Hodgins, Pfister and Viola, 2005)

“Shadow play is a Chinese art that has not yet transformed into a digital form.” (Li and Hsu, 2007, p.1601)

(Tan Kian Lam, 2008)

The work of (Tan Kian Lam, 2008, Lam et. al), drew together techniques for real-time simulation of shadow puppets, animation and visual look drawn from Chinese shadow puppet traditions. Using standard OpenGL techniques, the paper explores texturing, animation, depth of field blurring, intensity of light source and procedural algorithms for (automatic) animation.

From the perspective of performance and puppetry, although real-time image generation techniques were examined, no real-time performance system was described. The paper mentions the potential for real-time physics simulation in creating expressive animation, but doesn't develop or propose any techniques for performer-object control.

The paper mentioned an important and emerging theme of my work, that of

preservation of traditional crafts and the importance of digital media preserving and promoting cultural heritage. The real-time features of OpenGL: texturing properties, blending, animation and timers, lighting, shaders for blurring screen elements

real-time raytracing gpu programmable shaders

hard-ware acceleration of games physics

[TODO: SEQUENCE OF ANNOTATES IMAGES OF THE IK APPROACH TO ONE OF MY MULTIJOINTED FIGURES]

[TODO: SUMMARISE THIS QUOTATION FROM LAM] we have provided several solutions are provided in visual simulation and animation of virtual shadow play's puppet. Firstly, texture mapping and blending techniques are used instead of rendering technique in order to allow fast and interactive display in real time environment. Besides, several techniques that use various themes (lighting) and special effects such as blurring to bring the right atmosphere to the virtual shadow play are proposed. Hierarchical modeling method is adopted in order to model a realistic animation for the puppet to include real time elements that allow playing of shadow play naturally in virtual environment. Previous works are not interactive and require manual pre-ordering of the play using key-framed approach.

Spatharis - Karaghiozi

Notes on Karaghiozi Posters

Karaghiozi in Albania: 1940 The epic of the Albanian campaign was of decisive importance in modern Greek history. During that campaign, the Greeks demonstrated their faith in liberty and the ideals of their race - the ideals on which they had been nurtured for generation after generation. Greece decided to fight in October 1940, when Italy declared war on it, and despite the enormous difficulties was victorious over the forces of autocracy and Fascism. The message the Greeks sent out at that time was one of Liberty, Democracy and the right of all mankind, values which are deeply rooted in the soul of every Greek - and, of course, of Karaghiozi.

Quotations and Notes - Manovich

Manovich (nodate), <http://www.manovich.net/TEXT/assembling.html>

“As this article has tried to demonstrate, the differences between cinematic and synthetic realism begin on the level of ontology. New realism is partial and uneven, rather than analog and uniform. The artificial reality which can be simulated with 3D computer graphics is fundamentally incomplete, full of gaps and white spots.” (Manovich, nodate)

Manovich (nodate), <http://www.manovich.net/TEXT/assembling.html>

“The second goal, the simulation of real scenes, turned out to be more complex. Digital recreation of any object involves solving three separate problems: the representation of an object’s shape, the effects of light on its surface, and the pattern of movement. To have a general solution for each problem requires the exact simulation of underlying physical properties and processes. This is impossible because of the extreme mathematical complexity. For instance, to fully simulate the shape of a tree would involve mathematically growing every leaf, every brunch, every piece of bark; and to fully simulate the color of a tree’s surface a programmer has to consider every other object in the scene, from grass to clouds to other trees. In practice, computer graphics researchers have resorted to solving particular local cases, developing a number of unrelated techniques for simulation of some kinds of shapes, materials and movements.” (Manovich, nodate)

Manovich (nodate), <http://www.manovich.net/TEXT/assembling.html>

Isadora Duncan on body as engine

: “Before I go out on the stage, I must place a motor in my soul. When that begins to work my legs and arms and my whole body will move independently of my will. But if I do not get time to put that motor in my soul, I cannot dance. – Isadora Duncan” (Isadora Duncan cited in Preston, 2005, p.273)

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