LEA is a publication of Leonardo/ISAST.

LEONARDO
THE INTERNATIONAL SOCIETY FOR THE ARTS, SCIENCES AND TECHNOLOGY

Sabancı Üniversitesi

Goldsmiths
UNIVERSITY OF LONDON

VOL 17 NO 2 VOLUME EDITORS LANFRANCO ACETI AND SIMON PENNY
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SPECIAL ISSUE

DAC 09

after media : embodiment and context

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Leonardo Electronic Almanac
Volume 17 Issue 2
January 2012
ISSN: 1071-4391
ISBN: 978-1906897-16-1
The ISBN is provided by Goldsmiths, University of London

LEA PUBLISHING & SUBSCRIPTION INFORMATION

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Leonardo Electronic Almanac is published by:
Leonardo/ISAST
211 Sutter Street, suite 501
San Francisco, CA 94108
USA
Leonardo Electronic Almanac (LEA) is a project of Leonardo/The International Society for the Arts, Sciences and Technology. For more information about Leonardo/ISAST's publications and programs, see http://www.leonardo.info or contact isast@leonardo.info.

Leonardo Electronic Almanac is produced by Passero Productions.

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Making Inroads: Promoting Quality and Excellency of Contemporary Digital Cultural Practices and Interdisciplinarity

I would like to welcome you to the first special volume of the Leonardo Electronic Almanac. *DAC09: After Media: Embodiment and Context*, is a volume that generated from the conference by the same name that Prof. Penny chaired at the end of 2009.

DAC09: After Media: Embodiment and Context is the first of a series of special volumes of the Leonardo Electronic Almanac that are realized in collaboration with international academic, editors and authors.

Prof. Penny was inspired for this LEA special issue by the continuous developments in the interdisciplinary arena and in the fields of new media and digital art culture. He wanted to collate research papers that would provide the seeds for innovative thinking and new research directions. The authors featured in this volume, to whom we are most grateful for their hard work, will provide the reader with the opportunity to understand and imagine future developments in the fields of digital art culture and interdisciplinarity.

As I look at the electronic file of what we now internally refer to simply as *DAC09* the first issue of the revamped LEA, *Mish Mash*, printed and delivered by Amazon, sits on the desk next to my keyboard. The possibilities and opportunities of e-publishing, which also has physically printed outcomes, provide me with further thoughts on the importance and necessity of the work that is done by 'small publishers' in the academic field. The promising news of a new open access journal to be launched by The Wellcome Trust or the 'revolution' of researchers against Elsevier through the website http://thecostofknowledge.com/ with 9510 Researchers Taking a Stand (Thursday, April 12, 2012 at 10:57 AM) highlights the problems and issues that the industry faces and the struggles of young researchers and academics.

The contemporary academic publishing industry has come a long way from the first attempts at e-publishing and the revolution, if it can be defined as such, has benefited some and harmed others.

As the struggle continues between open access and copyrighted ownership,[1] the 'revelation' of a lucrative academic publishing industry, of economies of scales, of academics exploited by a system put in place by publishing giants (into which some universities around the globe have bought into in order to have an internationally recognized ranking system) and the publishers' system of exploitation structured to increase the share of free academic content to then be re-sold, raises some essential questions on academic activity and its outputs.

ISSN 1071-4391 ISBN 978-1-906897-16-1

The answers to these problems can perhaps be found in the creativity of the individuals who participate in what is, at times, an harrowing process of revisions, changes, reviews, replies and rebuttals. This is a process that is managed by academics who donate their time to generate alternatives to a system based on the exploitation of content producers. For these reasons I wish to thank Prof. Simon Penny and all the authors who have contributed to *DAC09: After Media: Embodiment and Context*.

Simon Penny in his introduction to this first LEA special volume clearly states a) the importance of the *DAC09* and b) the gravitas and professional profile of the contributors. These are two points that I can support wholeheartedly, knowing intimately the amount of work that this volume has required in order to maintain the high standards set by *Mish Mash* and the good reception it received.

For this reason in announcing and presenting this first special volume I am proud to offer readers the possibility of engaging with the work of professionals who are contributing to redefining the roles, structures and semantics of new media, digital art practices and interdisciplinarity, as well as attempting to clarify what digital creativity is today and what it may become in the future.

The field of new media (which are no longer so new and so young – I guess they could be better described as middle aged, slightly plump and balding) and digital practices (historical and contemporary) require new definitions and new engagements that move away from and explore beyond traditional structures and proven interdisciplinary partnerships.

DAC09: After Media: Embodiment and Context is a volume that, by collating papers presented at the DAC09 conference, chaired by Prof. Simon Penny, is also providing recent innovative perspectives and planting seeds of new thinking that will redefine conceptualizations and practices, both academic and artistic.

It also offers to the reader the possibility of engaging with solid interdisciplinary practices, in a moment in which I believe interdisciplinarity and creative practices are moving away from old structures and definitions, particularly in the fraught relationship between artistic and scientific disciplines. If 'cognitive sciences' is a representation of interdisciplinarity between artificial intelligence, neurobiology and psychology, it is also an example of interdisciplinary interactions of relatively closely related fields. The real problem in interdisciplinary and crossdisciplinary studies is that these fields are hampered by the methodological problems that still today contrapose in an hierarchical structure scientific methodologies versus art and humanities based approaches to knowledge.

This volume is the first of the special issues published by LEA and its appearance coincides with the newly revamped website. It will benefit from a stronger level of advocacy and publicity since LEA has continued to further strengthen its use of social platforms, in fulfillment of its mission of advocacy of projects at the

ISSN 1071-4391 ISBN 978-1-906897-16-1

intersection of art, science and technology. DAC09 will be widely distributed across social networks as open access knowledge in PDF format, as well as being available on Amazon.

I extend a great thank you to all of the contributors of *DAC09: After Media: Embodiment and Context* and wish them all the very best in their future artistic and academic endeavors.

Lanfranco Aceti
Editor in Chief, Leonardo Electronic Almanac
Director, Kasa Gallery

ACKNOWLEDGEMENTS

I would like to thank Ozden Sahin, LEA Co-Editor, for having delivered with constancy another project of which LEA could be proud. The LEA special issues are more similar to small books – 200 pages is not a small endeavor – that require special care and attentive selection.

I am very grateful to Prof. Simon Penny for the hard work that he has put into this volume and to the authors who have patiently worked with us.

To all of you my heartfelt thanks.

DAC09: After Media: Embodiment and Context is the first special volume of the Leonardo Electronic Almanac to be followed by many others that are currently in different stages of production, each of them addressing a special theme and focusing on bringing to the mainstream of the academic debate new forms of thinking, challenging traditional perspectives and methodologies not solely in the debates related to contemporary digital culture but also in the way in which these debates are disseminated and made public.

To propose a special volume please see the guidelines webpage at: http://www.leoalmanac.org/lea-special-issues-submission-instructions/

REFERENCES AND NOTES

1. Thomas Lin, "Mathematicians Organize Boycott of a Publisher," *The New York Times*, February 13, 2012, http://www.nytimes.com/2012/02/14/science/researchers-boycott-elsevier-journal-publisher.html (accessed March 20, 2012).

 ISSN 1071-4391 ISBN 978-1-906897-16-1

Two decades of Digital Art and Culture

An introduction to the LEA DAC09 special edition

by

Simon Penny

Director of DAC09
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This volume of LEA is composed of contributions drawn from participants in the 2009 Digital Art and Culture conference held at the University of California, Irvine in December 2009. DAC09 was the eighth in the Digital Art and Culture conference series, the first being in 1998. The DAC conference series is internationally recognized for its progressive interdisciplinarity, its intellectual rigor and its responsiveness to emerging practices and trends. As director of DAC09 it was these qualities that I aimed to foster at the conference.

The title of the event: After Media: Embodiment and Context, was conceived to draw attention to aspects of digital arts discourse which I believe are of central concern to contemporary Digital Cultural Practices. "After Media' queries the value of the term 'Media Arts' – a designation which in my opinion not only erroneously presents the practice as one concerned predominantly with manipulating 'media', but also leaves the question of what constitutes a medium in this context uninterrogated. 'Embodiment and Context' reconnects the realm of the digital with the larger social and physical world.

'Embodiment' asserts the phenomenological reality of the fundamentally embodied nature of our being, and its importance as the ground-reference for digital practices. 'Embodiment' is deployed not only with respect to the biological, but also with reference to material instantiations of world-views and values in technologies, a key example being the largely uninterrogated Cartesianisms and Platonisms which populate computational discourse. Such concerns are addressed in contemporary cognitive science, anthropology and other fields which attend to the realities of the physical dimensions of cognition and culture.

'Context' emphasises the realities of cultural, historical, geographical and gender-related specificities. 'Context' brings together site-specificity of cultural practices, the understandings of situated cognition and practices in locative media. The re-emergence of concerns with such locative and material specificity within the Digital Cultures community is foregrounded in such DAC09 Themes as Software and Platform Studies and Embodiment and Performativity.

The DAC09 conference included around 100 papers by an international array of contributors. In a desire to be maximally responsive to current trends, the conference was to some extent an exercise in self-organisation by the DAC09 community. The call for papers and the structure of the event was organized around nine conference themes which were themselves the result of a call to the community for conference themes. The selected themes were managed largely by those who proposed them. Much credit for the success of the event therefore goes to these hard-working 'Theme Leaders' : Nell Tenhaaf, Melanie Baljko, Kim Sawchuk, Marc Böhlen, Jeremy Douglass, Noah Wardrip-Fruin, Andrea Polli, Cynthia Beth Rubin, Nina Czegledy, Fox Harrell, Susanna Paasonen, Jordan Crandall, Ulrik Ekman, Mark Hansen, Terry Harpold, Lisbeth Klastrup, and Susana Tosca, and also to the Event Organisers: David Familian, Michael Dessen, Chris Dobrian, Mark Marino and Jessica Pressman. I am particularly grateful to Ward Smith, Information Systems Manager for DAC09, who for two years, as my sole colleague on the project, managed electronic communications, web design and the review and paper submission processes amid, as he would put it, a 'parade of indignities'. In the several months of final planning and preparation for the event, the acumen and commitment of Elizabeth Losh and Sean Voisen was invaluable.

I first published on what we now refer to as digital arts in 1987. [1] Not long after, I was lucky enough to have the opportunity to attend the first ISEA conference in 1988. Since that date I have been actively involved in supporting the development of critical discourses in the field, as a writer, an editor and an organizer of events. My role as director of the DAC09 conference gave me a perspective from which to reflect on the state of digital arts discourse and its development over two decades. As I discussed in a recent paper, [2] the first decade on media art theory was a cacophonous interdisciplinary period in which commentators from diverse fields and disciplines brought their expertise to bear on their perceived subject. This created a scenario not unlike that of various viewers looking into a house via various windows, none of them perceiving the layout of the house, nor the contents of the other rooms. In the ensuing decade, a very necessary reconciliation of various disciplinary perspectives has occurred as the field has become truly a 'field'.

While post structuralist stalwarts such as Deleuze and Derrida continue to be referenced in much of the more critical-theory oriented work in Digital Cultures, and the condition of the posthuman and posthumanist are constantly referenced, theoretical reference points for the field are usefully broadening. The emerging field of Science and Technology Studies has brought valuable new perspectives to media arts discourses, counterbalancing the excesses of techno-utopianism and the sometimes abstruse intellectualism of post-structuralist theoretical discourses. In this volume, Mark Tuters provides an exemplar of this approach in his *Forget Psychogeography: Locative Media as Cosmopolitics*, bringing Rancière and Latour to bear on a discussion of HCI, Tactical Media and Locative Media practices. Tuters provides a nuanced argument replete with examples which questions the sometimes, superficial and dogmatic re-citation of the originary role of the Situationists with respect to such practices. At DAC09, Connor McGarrigle also took a thoughtful revisionist position with respect to the Situationists. [3]

In this context, the new areas of Software Studies and Platform Studies have emerged and have been nurtured in previous DAC conferences. In this spirit, Chandler McWilliams attempt to "thread the needle between a reading of code-as-text that obfuscates the procedural nature of code, and an overly technical description of programming that reinstates the machine as the essential arbiter of authentic acts of programming" is emblematic of the emergence of Software Studies discourses which are quintessentially interdisciplinary and erudite on both sides of the science wars divide. Similarly, Mark Marino's meditations on heteronormativity of code and the Anna Kournikova worm call for what he calls Critical Code Studies, here informed by queer theory. In their proposal for an 'AI Hermenteutic Network' Zhu and Harrell address the question of intentionality, a familiar theme in AI critical discourse (i.e., John Searle 'Minds,

ISSN 1071-4391 ISBN 978-1-906897-16-1
ISSN 1071-4391 ISBN 978-1-906897-16-1

Brains and Programs' 1980). Citing Latour, Agre, Hayles and others, they offer another example of the science-wars-sidestepping technical development based in interdisciplinary scholarship noted in the discussion of Chandler McWilliams' contribution.

Another trend indicative of the maturation of this field is its (re)-connection with philosophical discourse. In this context, the deep analysis of Electronic Literature in terms of Wittgensteinian Language Games by Mauro Carassia is something of a tour de force. While a tendency to extropianism is here not explicitly discouraged, this discussion places such technological practices squarely as indicators of transition to post-human subjectivity, and in the process, open the discussion to phenomenological, enactive and situated critiques as well a drawing in the relevance of pre-cognitivist cybernetic theorisation.

One of the aspects of contemporary media arts discourse which I hoped to foreground at DAC09 was questions of embodiment and engagement with contemporary post-cognitivist cognitive science. Several papers in the current collection reflect such concerns, and indeed they were foregrounded in several conference themes. One example of the value of the application of such theory is evidenced in Kenny Chow and Fox Harrells leveraging of contemporary neuroscience and cognitive linguistics in their deployment of the concept of "material-based imagination" in their discussion of Interactive Digital Artworks. In a quite different approach to embodiment and computation, Carrie Noland discusses choreography and particularly the choreography of Cunningham, with reference to Mauss and Leroi-Gourhan, and with respect to digital choreographic tools.

The DAC community did not choose to make Game Culture a focal theme in DAC09 – perhaps because the field has grown so quickly and has built up a structure of conferences and journals. Nonetheless, gaming culture was referenced throughout the event, and was the subject of numerous presentations, such as Josh and Karen Tannenbaums reconsideration of 'agency as commitment to meaning', which addressed the acknowledged problematic of the tension between authorial and user agency in terms of a critique of the humanist subject. Like wise, phraseology such as Boluk/Lemieux's: "player performance in and around games has matured to the point of beginning to express underlying serial logics through heavily mannered gameplay mechanics" (in their contribution to this volume) signals the establishment of a mature and erudite critical theory of games and gaming. On a more technical note, Sullivan/WardripFruin/Mateas make an argument for enriching computer game play by application of artificial intelligence techniques to the authoring of 'quests'.

As Digital Arts became established as a practice the question of pedagogy inevitably arose – what to teach and how to teach it. Though rhetorics of convergence pretend to the contrary, one cannot dispute the profound epistemological and ontological dilemmas involved in attempting to bring together intellectual environments of such disparate communities as engineers, artists and critical theorists, in the classroom and the lab. Interdisciplinarity was therefore the ground upon which these programs were developed, and each context inflected that idea with its own color. My own reflections on the subject are published at *Convergence.* [4] It therefore seemed timely to address pedagogy at DAC09. In the process of elaboration of digital cultural practices, such emerging practices have themselves come into consideration as pedagogical tools and systems. In this volume, Elizabeth Losh surveys and discusses various pedagogical initiatives (mostly in Southern California) deploying digital tools and environments. In a contribution which crosses between the pedagogy thematic and concerns with cognition, Harrell and Veeragoudar Harrell offer a report on a science, technology, engineering, and mathematics (STEM) educational initiative among at-risk students which considers the relationships between users and their virtual identities.

In his essay, Garnet Hertz discusses the work of three artists – Reed Ghazala, Natalie Jeremijenko, and Tom Jennings. None of them 'media artists' in the conventional sense, they, in different ways and for different purposes, re-purpose digital technologies. Rounding out this volume is presentation of two online artworks by Sharon Daniels which were presented at DAC09. *Public Secrets* and *Blood Sugar* are elegant web-based art-works, both poetic and examples of a committed activist practice.

In my opinion, this collection offers readers a survey of fields addressed at DAC09, and an indication key areas of active growth in the field. Most of them display the kind of rigorous interdisciplinarity I regard as characteristic of the best work in the field. While the science-wars rage on in certain quarters, in media arts discourse there appears to be an attitude of intelligent resolution – a result in no small measure of the fact that a great many such commentators and theorists have taken the trouble to be trained, study and practice on both sides of the great divide of the 'two cultures', and to take the next necessary step of attempting to reconciling or negotiate ontologies traditionally at odds. This professional profile was very evident at DAC09 and is represented by many of the contributors in this volume. Such interdisciplinary pursuits are in my opinion, extremely intellectually demanding. The obvious danger in such work is of superficial understandings, or worse, a simple re-citation of a new canon of interdisciplinary media studies. Dangers that, happily, none of the papers grouped here, and few of the papers presented at DAC09, fell victim of. ■

The electronic proceedings of DAC09 are available at this link: http://escholarship.org/uc/ace_dac09

REFERENCES AND NOTES

1. "Simulation Digitization, Interaction: The impact of computing on the arts," *Artlink, Art+ Tech Special Issue* 7, no. 3 and 4 (1987).
2. "Desire for Virtual Space: the Technological Imaginary in 90s Media Art," in *Space and Desire. Scenographic Strategies in Theatre, Art and Media*, eds. Thea Brejezk et al. (ZHdK Zurich: Zurich University of the Arts, 2010).
3. This paper, and all DAC09 papers referenced here, are available as part of the DAC09 proceedings, online at http://escholarship.org/uc/ace_dac09 (accessed March 2010).
4. Simon Penny, "Rigorous Interdisciplinary Pedagogy: Five Years of ACE," *Convergence* 15, no. 1 (February 2009): 31 - 54.

ISSN 1071-4391 ISBN 978-1-906897-16-1
ISSN 1071-4391 ISBN 978-1-906897-16-1

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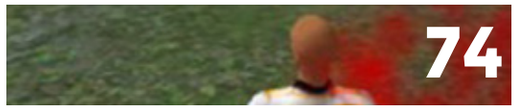

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 ISSN 1071-4391 ISBN 978-1-906897-16-1

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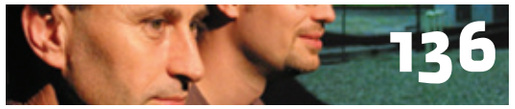

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An interview with Simon Penny

Techno-Utopianism, Embodied Interaction and the Aesthetics of Behavior

by

Jihoon Felix Kim & Kristen Galvin

In your writing you have criticized immersive VR technologies for their dream of detachment from human flesh and their rhetoric of command and control. Do you think your critical assessment is relevant to today's media artworks and communication technologies based on VR?

The 1990s was the formative decade for interactive art and digital culture, and throughout I critiqued both the technology and the rhetoric around the technology. Many theorists were expounding Utopian ideas of convergence, social harmony, world peace, spiritual redemption or collective intelligence. This worried me because while the technology was ostensibly new, the rhetoric was just another chapter in 200 years of techno-utopianism. Theodore Roszak quotes a poem about the steam train from the 1830s, "steel and her handmaid steam will make utopia only half a dream" and will "...bring peace on every line." [1] If you change key words to "Internet" and "Computer" it sounds like the rhetoric of the 1990s.

There was a preoccupation with "virtuality" and "the virtual". In hindsight, Virtual Reality was a 1990's problem which has since largely disappeared. In my analysis, the construction of the virtual was in large part a result of an incomplete technology. Situated social space is richly complex. We communicate and share our intelligence via different sensorial qualities, gestures, tone of voice, gaze, and movement. In comparison, the virtual realm, which was increasingly complex, had different qualities.

By the end of the 1990s, two important things happened. Technologies that had been the subject of intense research and speculation were finally bearing fruit: sensor based and mobile technologies, improved web and Internet services, and vastly improved graphics processing. The net result was a collapsing of the virtual back into the real. It became clear through networked virtual worlds and multi-user gaming that the dream of full body immersion was an obsessive engineer's dream. Some of the arguments for such immersion turned out to be technologically intractable and culturally unnecessary. The experience of sitting at a small screen could be 'immersive' and much cheaper than the technologically intensive wrap-around stereo of VR. The Virtual Reality technologies of the 1990s were, if you like, dinosaurs. They were adapted to a certain environment and smaller more efficient species made them obsolete. The gaming PC, the little hot-blooded rat, was cheaper and more successful.

Do you think that mobile media are amenable to augmenting the user's embodied interaction with the digital world?

Mobile media has enabled the meshing of the virtual with embodied social experience. I no longer think in terms of making the virtual accessible because it's increasingly integrated into the social fabric.

In your essay in the First Person anthology you argue that body training given in the first-person shooting games such as Quake by the collusion between the military computer simulation and interactive entertainment has an enduring and strong effect. [2] How do you think we can deal with this harmful effect of video games? And in what ways can media art contribute to intervening in this situation?

My point was to assert the need to be clear about the techno-historical roots of such entertainment. Not simply that it is militarized technology, but that it inheres an industrialized relationship with the world. That is not surprising because ,in most contexts, computers in industry increase efficiency, increase production, reduce downtime, and streamline the productivity of the human. It's a man-machine interaction in the original sense of the SAGE system and the military applications of the 1960s where people are harnessed to machines. It's really not so different from Charlie Chaplin in *Modern Times*. Just because it's a digital machine doesn't mean the logic of production is different. If we see that the vast numbers of computers in the world are deployed in work environments to increase efficiency: the technology comes complete with a structuring of human behavior. If you take those technologies and say now play with it, you also import those relations to the technology and an ethos of efficient productivity.

That said, I think that humans and human culture are infinitely creative in their relations to emerging technologies and new cultural practices constantly emerge which push and pull the technologies in different ways. It is easy to see that the first generation of gaming would adopt and adapt the existing structures. But I also believe that gaming is very likely to be the cultural form which defines the 21st century, in the same way that cinema defined the 20th century. We then must view the gaming that we are doing now

ISSN 1071-4391 ISBN 978-1-906897-16-1
ISSN 1071-4391 ISBN 978-1-906897-16-1

as like the work of Melies and the Lumiere Brothers in relation to cinema. I fully expect that we will have our Buñuels and our great game authors, our Shakespeares of mobile gaming.

A James Joyce of online gaming.

Exactly. People are now naturalized to networked digital interaction as children. As they grow and become more culturally and intellectually sophisticated, they want more. That is quite clear when we look at some of the emerging complex gaming systems, and the way people are détourning the game's social environments; we are seeing the emergence of a fascinating new culture.

What can media arts do in relation to that largely popular and commercial art form?

I think that we can critically address elision and lacunae by presenting models of other possibilities. One of the things that I do in my work, is to create environments of play, but predicated on the different ideas of what play is. They are involved with dynamic bodily movements and a playful interaction that does not involve scoring or oppositional structures.

After hearing your presentation, I think one of the most important issues is how to translate this sort of new idea of consciousness into the user's behavior, and how to make this sort of artwork with the new machine.

Coming to interactive artwork from a background in sculpture, performance, and installation, I've always been struck by the conflict between the paradigms of embodied engagement with practice, both as a maker and as one who experiences the work and the paradigms that are inherent in technologies. I felt that underlying the fundamental premises of computer technology is the acceptance of Cartesian dualism, the separation of the mind and body. This separation is written right into the technology as hardware and software. It is inscribed into the fundamental premises of computer science.

This separation is also reflected in the history of the psychology of perception and also, to some extent in the history of fine arts. The western perspectival view proposes a single, powerful viewing position, and that authoritative gaze position is only possible at a distance from the object. It is worth noting that only by taking a small slice of the world can that perspectival representation remain coherent. That is a technical argument from the history of painting. But when we start to do interactive art, we can no longer maintain that distance. We are in the middle of the experience, temporally and spatially. So the perspectival objectivist position is no longer tenable. Nor is the paradigm of contemplative perception, which says, 'I sit here as a passive individual and information about the world flows in to me an unproblematic way.'

Part of my project has been to try to find theoretical resources to build a new aesthetics around a rejection of these premises to formulate what I refer to as an 'aesthetics of behavior'. It is premised on the idea that when we use real time computational technologies for cultural practice we are doing a new aesthetic practice, which involves the designing of behavior. We are somehow building a contingent model for what might happen in the world, and how our system might respond in order to direct the aesthetic attention of the user to a direction consistent with the artwork itself. It is a complex and new aesthetic negotiation of the dynamics of interaction and authorial intent. There is no such thing as a neutral artwork: you make an artwork to say something. But if the user has the freedom to explore in a space rather than be placed in a passive position while the information is poured in, then you have to rebuild the strategies of the artist. This is crucially important if you want to build in a theoretically coherent way – you cannot subscribe to a western perspectivalism or a Victorian psychology of perception.

I've turned to cybernetics, to phenomenology, to enactive cognition. I find the work of authors like Francisco Varela, Mark Johnson, George Lakoff, Alva Noë, and Andy Clark useful, as they address emerging neuroscientific research that is giving rise to a new cognitive neuroscience called enactive cognition. It is premised on the non-separation of perception and action, it is

ISSN 1071-4391 ISBN 978-1-906897-16-1

People are now naturalized to networked digital interaction as children. As they grow and become more culturally and intellectually sophisticated, they want more.

a constant loop. That scenario is also descriptive of interaction. I want to build a new aesthetics that is rooted in that approach to "being." Andy Pickering, a sociologist of science, talks about the British cyberneticians, Gordon Pask, Grey Walter, Ross Ashby, and Stafford Beer, and he says that the difference between their science and normative science was that normative science functions in a representational mode, and the British cyberneticians functioned in a performative mode. For me that shift from the representational ontology to the performative ontology informs a new logic that underlies the aesthetics.

I see this opposition between the representative and the performative in some of your works, such as *Traces*, *Fugitive*, *Body Electric*, all of which set into motion the user's performative role. [3] You said that "the goal of *Traces* to combine the bodily immediacy of dancing with the spatial experience of sculpture." Is this idea influenced by 1970s conceptual video art that questioned the whole process of creating the artwork and the viewer, disoriented both the viewer and the artist, and experimented with spatial variables of artwork artist practices?

I am a product of my history no doubt. As an art student, my education was informed by the cultural revolution of the 60s. One part of that revolution was conceptual art. Another part was a questioning of bodily presence, such as embodiment, physical context, and social context. With hindsight, I see a bifurcation in the 60s between artists concerned with situation and embodiment, and the work of the conceptualists preoccupied with abstract reasoning. (Many) conceptualists aspired to removing matter from art. Donald Judd said 'Everything sculpture has, my work doesn't'. They were opposed to material instantiation. That's very Cartesian. They thus had a kinship with Artifical Intelligence, which was also on the rise at the same time. But other aspects of that 60s explosion were concerned with social and bodily context. I'm influenced by those ideas. I think that every other media artist who came from that background was also influenced by those ideas.

It reminds me of works by Vito Acconci, Joan Jonas, Maria Abramovic, and others, all of whom created the artworks that call into question the relationship between the artist and the viewer, and the viewer's interaction with the space.

Which brings up the relation between the screenal and the pictorial and how that connects with the enactive embodied approach. For instance, in a project like *Fugitive* I was very conscious that I wanted to create an experience that disrupted the fixation of the user on a fetishized screenal space. In part, *Fugitive* was a critique of certain aspects of the rhetoric of

ISSN 1071-4391 ISBN 978-1-906897-16-1

TRACES Vision System

Volumetric body model (two views above) is derived from four video images (below) in real time.

virtual reality: the architectonic nature of the virtual space, combined with the reduction of the identity of the user to a single xyz point in the space, disembodied the user (contrary to the rhetoric of the VR). Users had to submit to a highly disciplined order of the virtual world. It wasn't freedom, you could only move in a pre-designed way. You became a passive viewer. (I would play Iggy Pop's song, " I am the Passenger, I travel under glass" to illustrate this syndrome). When I built *Fugitive,* I did not want to create a structured visual environment that disciplined the user to move in certain ways. The illusion of fugitive is incomplete and discontinuous precisely because I wanted the structuring continuity to be that of the user's embodiment through time, not the spatio-temporal continuity of the visual experience. I wanted to turn the attention of the user back on the temporal continuity of her embodiment in space, rather than on an illusory screenal space.

The Traces Vision System (by Simon Penny, Andre Bernhardt and Jamieson Schulte) was a custom real-time 4 camera, infra-red 3D volumetric machine vision system which ran on a 166mhz pentium PC. This vision system was the data input for Traces, a CAVE interactive immersive environment. An updated version was also used in Body Electric (to drive 8 channel spatialised audio as well as bodily interaction), and in FugitiveII.

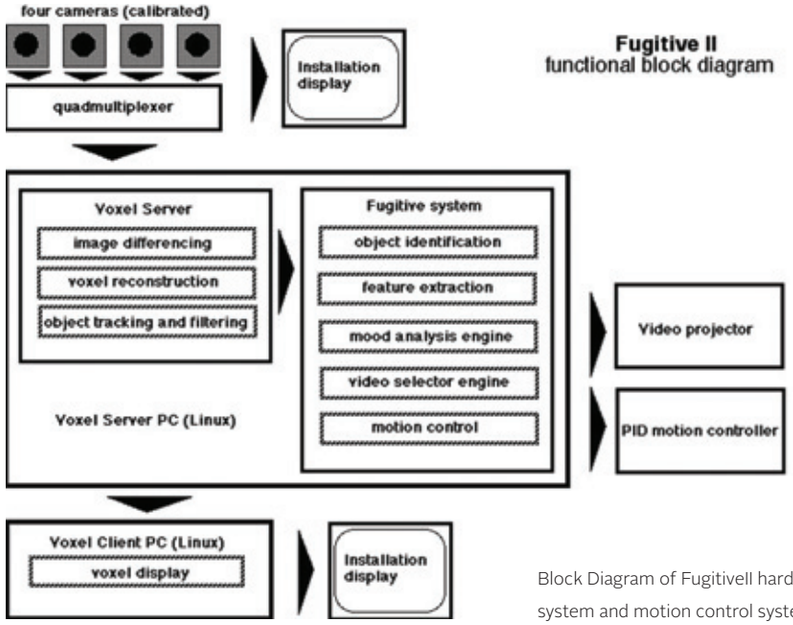
Fugitive raises questions about the paradigm of the cinema. Although I have theorized this position, I admit it is slightly pathological. I feel uncomfortable in the cinema because my innate response to my visual experiences is disciplined. When you are presented with an affectively powerful cinematic experience, there's an internalized suppression. You sit and you take it. You have no possibility to act. For me that scenario of cinematic consumption is highly disciplined. I have tried to allow action and response back in.

Against the notion the interface of frame and screen, based on the perspectival system...

That's right, as a viewer in the cinema, the perspectival window is reproduced. It's a reversal of the powerful exterior viewpoint, because you are not in it, but yet you are subject to it.

Concerning your ongoing intervention of anti-cinema in your work, what deconstructive cinema apparatus is apparent in your work such as *Ceci N'est Pas Un Oiseau?*[4] How does it relate to Expanded Cinema from the 1960s to the present, and how does it differ?

One of my goals in works like *Ceci N'est Pas Un Oiseau* was to play with the thresholds between the illusion of movement and the static image. I tuned the speed of the images to the threshold of persistence of vision: you could consciously play with whether you saw a moving image or a sequence of still images. I wanted to deconstruct the cinematic illusion. Another method of deconstruction in that work was to present the machinery that created the illusion with the screenal space. Instead of making that machinery invisible and subject to a suspension of disbelief, I foregrounded it. It's noisy and it's bright. I also wanted to make the screen more sculptural so it couldn't be an illusory window. It was an object in the space. The work comprised two objects, one was the screen object, and the other was the projector object. I wanted to represent the whole cinematic system.



Block Diagram of FugitiveII hardware, including custom vision system and motion control system.

Similarly, in *Fugitive*, a pan sequence is played back on a circular wall, at a corresponding angle to the original shot. It's cinematography in reverse. If I take a full 360° pan shot and show it on a normal fixed screen, the images move across the screen, and intellectually I have to reconstruct that as I am moving, I am rotating in the space. One of things I hoped to do in *Fugitive* was to unwrap that aspect of the cinematic illusion.

Many researchers coming from cinema studies have a narrow range of knowledge about the diversity of current media arts. They tend to associate all the trends of media arts or the expansion of cinema as fundamentally screenal, but there are many other trends that go beyond it.

Certainly a significant number of first generation media art theorists had a film theory background, and that has led to accentuating filmic aspects of media art and ignoring or remaining oblivious of other aspects. In the early 1990s, no one was writing about media art, and artists had to theorize their own field. As with any new field, theorists entered from different disciplines and film theory has been a strong influence. The problem is that film theory orients the attention of the audience to the similarities between media art and film. If you say that media art is just another screenal media, you miss the parts that I'm trying to pay attention to. The term media art is dangerous, because I don't think of what I do as working with media. The concept of media constrains me in a way I'm not interested in. Unfortunately, one's always looking for descriptive terms that are brief and succinct. I try to use the term digital cultural practices – a little clunky.

What attracted you to the idea of the digital trace or the digital specter?

In *Traces*, the motivation came out of my critique of virtual reality. The rhetoric of embodiment was false because while you were presented with a visual stereoscopic environment, which was somewhat immersive, you were reduced to almost nothing, a single xyz point in space. I wanted to build a system in which the computational system recognized the full volumetric and gestural nature of the body, so I built the multi-camera vision system for the CAVE. This captured in real-time the volumetric and gestural nature of the

ISSN 1071-4391 ISBN 978-1-906897-16-1
ISSN 1071-4391 ISBN 978-1-906897-16-1

body and then used that only to change the stereoscopic representations in the space. What the viewer experienced was a manipulated record of their spatial occupancy and gesture. I was thinking of Marey's chronophonographs when I began the work, so one of the images provoking the project was the idea of a 3D time-lapse photography, a record of one's movement through space captured as a virtual sculptural form. I still find that idea beautiful.

The works arise from taking a critical position with respect to technologies and rhetoric, *Traces* is positioned in a critical way with respect to the contemporary virtual reality projects of the day. Navigation through Virtual Worlds was paradigmatically the VR experience. In *Traces* there is no (architectonic) virtual world and no navigation. In making that project we used a commercial authoring environment for the CAVE called *CaveLib*. But it turned out that 80% of it was designed around the idea that doing VR was building virtual architectural spaces and putting texture mapped panels on them. We did not have any virtual architecture, nor any virtual texture map panels. As a result, most of the code for *Traces*, like most of the code in most of my works, is completely custom because the goals were different.

The notion of "the avatar as semi-autonomous agent" is one of the essential notions of your *Traces* and in other works, by which you explored immersive bodily interaction with computational systems. Could you give us a more detailed account of this notion? I'm wondering whether this agent is different from the "artificial life" which appears in a number of practices of contemporary Bio-Art, or Genetic Art.

The thought around autonomous agents, and the thought around artificial life are separate, but related. Artificial life as a practice and a theoretical approach emerged in the late 80s and the early 90s attempting to address the shortcomings of traditional artificial intelligence. There was quite radical research done in the late 80s and the early 90s by people like Luc Steels, Rodney Brooks, and Pattie Maes. They abandoned the objectivist, top-down conception of artificial intelligence approaches because it simply wasn't working for robotics. At the time I was building *Petit Mal* and the project had similarities with their

Petit Mal in Smile Machines (curator Anne Marie Duguet) (Transmediale 2006). Petit Mal was built 1990-1995.

ISSN 1071-4391 ISBN 978-1-906897-16-1

Autonomous agents had their own agendas and worked in their own native space. It wasn't a mirroring or prosthetic sort of control, like an avatar.

research.[5] Although those motivations were coming out of my practice as an installation artist, they were consistent with the critique that these people had of conventional robotics. So somewhat accidentally, I found myself among the forefront of radical robotics thinking.

You could say that *Petit Mal* is an autonomous agent and a realization of an artificial life entity. Not simply in the sense that it manifests some behavior that is life-like, but that it has a bottom-up logic – it doesn't conform to a traditional artificial intelligence way of viewing the world, sometimes referred to as the sense-map-plan-act paradigm. It is reactive in the way that an insect or an animal is reactive. It is consistent with reactive robotics, which was a response to the over-reasoned over-complex computational solutions of the previous generation of artificial intelligence.

While the term *agent* has been applied in many ways, I was mostly preoccupied with socially situated synthetic entities. Autonomous agents had their own agendas and worked in their own native space. It wasn't a mirroring or prosthetic sort of control, like an avatar. Some of the entities that we included in *Traces*, I called 'semi-autonomous agents' because I was concerned with creating synthetic entities that you could influence or interact with. They were not 'autonomous agents' over which one could have no influence.

So, your notion of the semi-autonomous agent was developed during your initial work in robotics... I'm wondering whether *Petit Mal* is influenced not simply by neurology, but also by Dadaism. It's key materials, such as pendulums and bicycle wheels, and its elaborate but unpredictable movement, remind me of "machines out of order" made by Marcel Duchamp and Francis Picabia.

I've been quite critical of Duchamp. I'm certainly critical of that tradition of representation of machines in Modernism through to mid-20th Century, and in particular I think that representation is characterized by Jean Tinguely. Jean Tinguely was famous in the 1950s and 1960s for making crazy machine sculptures. Tinguely's work lampoons the machine. It reflects an insecurity with the machine, because the power of the machine is an ability to be perfect, and consistently repeatably perfect. I have felt, from the early days, that mechanical, electro mechanical and electronic technologies provided me with resources to do new kinds of artwork. While I have a critique of industrialism and the machine, I didn't want to create simplistic Luddite representations. I really wanted to make machines that worked properly, but worked as cultural gestures. So that is the answer to the first part of the question. The second part of the question...

I'm wondering why you turned your attention from robotics to the machine vision.

Coming from a history of making artifacts, I have a deep commitment to manipulating matter. I like to work metal, I like to build things, I like to design and build things and see that they are successful. But if I wanted to add a new behavior to *Petit Mal,* I would have to spend three months prototyping and building new hardware components. In the image world, you

ISSN 1071-4391 ISBN 978-1-906897-16-1

Simon Penny and Andre Bernhardt (software engineer for Fugitive II) inside the installation, showing elliptical image projected on wall of circular room ~10m diameter.

can simply change the code, and have a new behavior. There is a certain freedom and flexibility in the world of computer-based imagery which is attractive. That was the motivation for moving from mechanisms and electronics to building an environment like *Fugitive* . Another piece, *Sympathetic Sentience*, is an experiment in emergent complex behavior very much in the tradition of artificial life. It is a community of artificial life organisms. They are little circuit boards, totally custom hardware electronics. I move back and forth between my commitment to the manipulation of matter and artifacts and the sort of flexibility that computer graphics and coding permit.

When I built my first machine vision system, none of these things were available commercially. Machine vision was at the cutting edge of robotics research. In the mid 1990s, my collaborators (Jamie Schulte and Andre Bernhardt) and I managed to make a real-time, machine vision system using a 166 MHz PC which we used in the first iteration of *Fugitive*. It was a significant technical achievement. It is quite extraordinary that 10 years later, systems like the ones I spent years building, can now be purchased from a computer store and plugged into your PC.

The sensor based interaction paradigms and systems that I and other media artists developed (such as Rafael Lozano Hemmer, Perry Hoberman, the Pares brothers and others) in the 1990s are now reflected in the Wii and other vision based interface devices. From an art historical or history of technology perspective, the history of innovation by media artists is constantly erased. There are many examples of fundamental technical research done by artists, which is forgotten and then reinvented 10 to 30 years later in commercial and academic contexts. An early example is the robotic artist Edward Ihnatowicz who lived in London. In the early 1970s he built a reactive robotic sculpture called *The Senster. The Senster* embodied ideas that the academic and industrial robotic communities would not address for 30 years. Because he was a very prescient visionary, nobody knew where to put his work. It is dangerous to be too far ahead of your time.

In an essay written in 1996 you concluded, "Is the web the environment where interactive art will settle? Only time will tell." [6] How do you see today's explosion of networked multimedia dominated by user-generated content – blog, weblog, and YouTube – in terms of their role in artistic possibilities?

I suspect that the project of interactive art, like the project of virtual reality, might have had its historical moment. In the 1990's, artists were actively exploring the formal dimensions of these new possibilities. A whole community of artists, some of them forgotten and some of them now famous, did fundamental research into the modalities of interactive, immersive, sensor-based, cultural practices. Clearly, the web/Internet has emerged as a fundamental new technology of the 21st century. Art can exist in that environment, but it is a highly codified environment, and there is still a huge opportunity for research art practices that do not conform to the web's constraints. I'm also dubious about the ongoing preoccupation with telematics and I want to offer some corrective to that. In everyday life there are direct physical connections with other people, physical artifacts and environments. I have worked in real-time telematic interaction, tele-robotics, and all sorts of other things, but increasingly I find that work unsatisfying. At at this point, I can't think of a telematic practice that is really culturally progressive or offers new ideas. Multi-user gaming seems a more interesting cultural form than live telematic music performance.

There have been some profound telematic artworks, and some of the most interesting were very early, such as *Hole-In-Space* by Kit Galloway and Sherrie Rabinowitz,in 1980. It was a real-time satellite event between Los Angeles and New York, with two shop windows with live audio and video, by satellite, and cost thousands of dollars. You had people walking down the street in NY looking at live video of people in shorts and t-shirts in LA. It was dark in NY and light in LA. They saw the people in the image going "Oh what's that" and they realized that there was a real-time connection, It was astonishing at the time. It was a utilization of telematic technology as a public artwork that was really remarkable,

This reminds me of a passage in your article entitled "Agents as Artworks and Agent Design as Artistic Practice" where you say, "some works are so simple that it is easy to understand but immediately boring (while) others are so complex that the average user cannot discern the way in which they work." [7] To address this you offer your idea of auto-pedagogic interface. Is this dilemma still pervasive in the contemporary media art scene? And do you have a more developed idea of the auto-pedagogic interface?

I wrote that paper in 1997. It was a reflection on the previous 7 or 8 years of interactive art practices. As I mentioned, it was a time when artists were exploring the formal dimensions of the new technologies. I noted the need to develop an aesthetics of behavior which is rich and complex, and I still believe that is an important task. It was relevant at the time because we were making novel interfaces that people had never experienced before. In my conception of an artwork, you engage it directly. The challenge was how to create an interesting and engaging experience for a person without making users read a manual or do a tutorial.

What has changed is that people are now naturalized to certain kinds of interaction with digital machines. It's a literacy, they know what to do. Once they are naturalized to specific modalities of interaction, they are not confused by the formal dimensions of the system. In such contexts that question has gone away. I continue to make novel interfaces so for me the question remains – how do we design for the richness of the unfolding experience of the user. Part of that could involve an increase in the complexity of the dynamics of interaction. I think it's still an important theoretical and aesthetic question. ■

REFERENCES AND NOTES

1. Theodore Roszak, "The Cult of Information: A Neo-Luddite Treatise on High-Tech," in *Artificial Intelligence, and the True Art of Thinking* (Berkeley: University of California Press, 1994).
2. Simon Penny, *Representation, Enaction and the Ethics of Simulation* (Cambridge, MA: The MIT Press, 2004).

3., 4., 5. see http://www.ace.uci.edu/penny

6. Simon Penny, From A to D and back again: The emerging aesthetics of Interactive Art, Next Wave Festival/Perception and Perspective Catalog (Melbourne: National Gallery of Victoria, Australia, 1996). Also published in *Leonardo Electronic Almanac* 4, no. 4 (April 1996).
7. Simon Penny, "Agents as artworks and agent design as artistic practice," in *Human Cognition and Social Agent Technology*, ed. Kerstin Dautenhahn (Amsterdam: John Benjamins, 2004), 395 – 413.

ACKNOWLEDGEMENTS

This interview text is an edited version of an interview conducted by Jihoon Felix Kim at the International Symposium on Art and Technology, Korea National University of the Arts, Seoul, Korea, November 2008. Edited by Kristen Galvin.

ISSN 1071-4391 ISBN 978-1-906897-16-1
ISSN 1071-4391 ISBN 978-1-906897-16-1