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**145**

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# Arts and Technology

Fourth International Conference, ArtsIT 2014  
Istanbul, Turkey, November 10–12, 2014  
Revised Selected Papers

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ISSN 1867-8211 ISSN 1867-822X (electronic)  
Lecture Notes of the Institute for Computer Sciences, Social Informatics  
and Telecommunications Engineering  
ISBN 978-3-319-18835-5 ISBN 978-3-319-18836-2 (eBook)  
DOI 10.1007/978-3-319-18836-2

Library of Congress Control Number: 2015938748

Springer Cham Heidelberg New York Dordrecht London

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Printed on acid-free paper

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## Preface

This book is published in the ICST Springer series as a coedited volume resulting from the international conference titled ArtsIT 2014, hosted in Istanbul, Turkey in November where the coeditors were principal organizers. Previously, ArtsIT 2013 and 2011 have also resulted as a similar ICST volume book.

As main steering person, the author states upfront acknowledgment as behind all volumes and all conferences there are local and international teams of “worker bees” that strive to ensure all things are covered, from the web page window to the world, delegate registrations, the numerous communications between all parties, setting up all the locations including venue, conference hotel, restaurants, and more. As in prior ArtsIT events, 2014 was no exception with all personnel again performing at an outstanding level. Thanks to all involved.

In writing a preface, the task is to basically and briefly introduce the contents that lie ahead of the reader, however, before doing that I wish to abridge from the welcome text created for the conference program to give the reader an idea of the fantastic venue that Istanbul offers for international conferences.

In attending ArtsIT 2014 in Istanbul, alongside attending the conference, delegates had a wonderful opportunity to explore one of the cultural treasures of the world, a city that offers a melting pot of people and places to experience and return home the richer from it.

For myself, when first visiting to meet the local organizing team and review the proposed venues, I took time to be a weekend tourist to anticipate what conference delegates were offered by the city of Istanbul. However, the abundance of historic national treasures quickly made me realize that my time was too limited, so I was pleased to confirm the hosting in the knowledge of my return for ArtsIT 2014 to again experience additional parts of the city.

During my trip I became aware of the richness of Ottoman art, both the architecture and the text-based images in languages I did not understand. The aesthetics drew me in: I was fascinated. It was an art seeped in history with clear influences of Hittites, Ancient Greeks, Islamic, Persian, and Byzantines. I also experienced ceramic mosaics, colored tiles in palaces, mosques, and Türbe Mausolea: These were followed by visits to the Basilica Cistern (my underground excursion – a welcome break from the midday heat and dense traffic); Aya Sofya; the Topkapı Palace; the Blue Mosque; the Süleymaniye Mosque; the Chora Church; and the Galata Tower.

I realized how little I knew about this wonderful place and its historic and ongoing contribution to the art(s) world(s), both physical and virtual, as well as to life itself. In addition, the friendliness of the people I met made me feel at home.

Returning to Istanbul for the event itself I promised to treat myself to complete the planned program from my previous visit, the plan included a massage at the Ayasofya Hürrem Sultan Hamam; a public ferry up the Bosphorus to Andalou Kavagi to climb the Genoese Castle to see amazing views of the Black Sea, including fish at the

wonderful local restaurants, and finishing with a tram up the Grand Rue de Pera (İstiklal Caddesi). I again ran into trouble with time, as there is so much to experience in this wonderful cultural center — what a fitting place for an ArtsIT event! There was no doubt in my mind that what was on offer at and alongside the conference was a very special experience for all and in the welcome text I recommended all to embrace the opportunity to explore and experience riches beyond material wealth that are offered... delegates were promoted to get their DigArt + Istanbul “fix”..., which I was positive would result in their desire to return to the city in order to fill their own personal cup with more knowledge, experiences, and stories to share.

As posited earlier in this preface, this book results from the international conference ArtsIT 2014, which was held in the venue ‘Minerva Han’, the city-based Communications Center of the Sabancı University that sponsored ArtsIT 2014. Minerva Han is located in the very heart of the city in the up and coming area of Karaköy, which offered a unique location for the international delegates to present their works.

In the days of the event, delegates experienced peer-reviewed works of researchers, artists, designers, and industry members whose ideas and creative outputs will help shape the future of art and technology. The papers representing these works cumulate as the contents of this book, which I introduce in the following.

Two keynote talks were presented at ArtsIT 2014. The first keynote was ‘**From Analog to Digital, Fictive vs. Documentary: An Ongoing Journey**’ by Murat Germen.

Murat Germen is an artist using photography as an expression/research tool. Having a M. Arch degree from Massachusetts Institute of Technology, where he went as a Fulbright scholar and received the AIA Henry Adams Gold Medal for academic excellence he works as a professor of art, photography, and new media at Sabancı University in Istanbul. Having published many articles/photo series on architecture/photography/art/new media in various magazines/books; he has been accepted to several symposia/conferences e.g., SIGGRAPH, ISEA, Mutamorphosis, Towards a Science of Consciousness, CAe, CAC2, EVA-London, eCAADe, ASCAAD to lecture on pertinent topics. Germen has credits for over 50 international exhibitions e.g., in Turkey, USA, Italy, Germany, UK, Mexico, Portugal, Uzbekistan, Greece, Japan, Russia, Iran, India, France, Canada, Bahrain, Korea, Dubai, China, Sweden, Switzerland, and Egypt.

The keynote talk focused upon a personal update of Germen’s sojourn as an artist/academician - a journey that led him from analog to electronic medium spanning a timeline of 30 odd years. The ongoing exploration that started with city planning, architecture, and photography was first presented where he described how he acquired and developed his analog skills. Following this he detailed his bridging from analog to encounter digital mediums. Possible commonalities between analog/digital were then discussed by bringing in notions such as serendipity, surprise, uncertainty, inadvertence that lie at the heart of his creative practice. These aspects constitute the grounds upon which he bases his computational art experimentations and academic research on various transformations in contemporary aesthetics that he believes arise out of digital creativity. Germen closed by stating how his main visualization area is photography wherein indispensable conceptual components such as representation, real, surreal, objectivity, subjectivity, construct influence through being linked to his empirical process based practice.

In the talk Germen revealed his cultural, social, political stance in the light of issues such as local vs. global and rhizomatic vs. hierarchic. A special emphasis was on presenting his recent concentration on documentary work, after numerous fictive constructions in the digital realm. His objective in his work is to emphasize participatory, collective culture, and history making by taking advantage of the democratization brought by ubiquitous mobile imaging and social media communication.

Original, Astute, and provocative an important message was shared in Germen's keynote, which consisted of a body of creative work representing the speaker's selected art history in pictures. A text supplementing the keynote is offered as the opening chapter in this book.

The second keynote speaker was Paul Brown who presented '**Notes Towards a History of Art, Code and Autonomy.**'

Paul Brown was a member of the Slade School of Fine Art group that many point to as pioneering the field of computer art. He is still active as an artist and writer specializing in art, science and technology where he has been prominent since the late-1960s and in computational and generative art since the mid-1970s. His early works included creating large-scale lighting works for musicians and performance groups such as Meredith Monk, Music Electronica Viva, Pink Floyd, and others. He has an international exhibition portfolio that includes the creation of both permanent and temporary public artworks dating from the late 1960s. He has participated in shows at major venues e.g., at the TATE, Victoria & Albert Museum, and ICA in the UK; the Adelaide Festival; ARCO in Spain, the Substation in Singapore, and the Venice Biennale and his work is represented in public, corporate, and private collections in Australia, Asia, Europe, Russia, and the USA. With Charlie Gere, Nick Lambert, and Catherine Mason he was a coeditor of *White Heat Cold Logic - British Computer Art 1960–1980* (MIT Press, Leonardo Imprint, 2009). Since 2005 he has been honorary visiting professor and artist-in-residence at the Centre for Computational Neuroscience and Robotics, School of Engineering and Informatics at the University of Sussex.

Brown's keynote opened by presenting how the work of Paul Cezanne, Georges Seurat, and their contemporaries had a profound influence on the art of the 20th century. Specifically, he posited how art as a formal analysis of its own internal processes became a common theme of several inter-related art movements that in the 1960s overthrew the concept of 'art as object' and replaced it with the concept of 'art as process'. He introduced how the systems and conceptual artists embraced and developed these ideas and then, in the 1970s, how a new generation of artists began to encode these concepts using the formal linguistics made possible by the new science of computing. He explained how computer art, as such, was not new, and that by 1970 it was at least 20 years old and already in 1968 Jasia Reichardt, at London's Institute of Contemporary Art (ICA), had curated a major historical survey of the field called *Cybernetic Serendipity*. He closed by stating how it was the young artists working at the Slade School of Fine Art's postgraduate Experimental and Computing Department from 1974 to 1982 who were specifically applying the ideas from both systems and conceptual art within the context of the emergent computational domain.

For many present this was a trip down history with the hand held by one of the pioneers of the form. The audiences' many questions embodied the reaction of all as it

was clear the pleasure Brown took in sharing his many experiences and stories that continued to be discussed at the coffee break.<sup>1</sup>

The first contribution in this book presents the paper titled **The Substance of the Body in the Societies of the Contemporary Arts** by **Emmanouela Vogiatzaki** from the Open University of Cyprus, Department of Theatre Studies, Cyprus and **Artur Krukowski** from Intracom S.A. Telecom Solutions, R&D Unit2, Greece.

This text presents the authors' concept of observing the substance of the body in the Performance Arts. By taking into account that the Art reflects social, cultural and sometimes political realities, the authors trace what kind of messages an artwork with advanced technological means transmits to spectators or artists. This study concentrates on the Cyborg Theatre, in which the technology is considered an important element in order for a performance to be staged. It is a technological performance, which cannot occur without the presence of a body. Here reference is to a cyborg body as an extended human organism, a cyborg being with mechanical parts, which integrates non-organic means in order to obtain substance inside the artwork. Focusing at this kind of theatrical performance, the authors observe the relationship that develops between the performer and the spectator. The text posits the unusual interaction between those two parties, which deserves attention. The claim is made that both the performer and the spectator take part in a social event that not only transmits societal realities, but also indicates future ones.

The second contribution is **Google DevArt: Following the Success of Google's Android Market in the Visual Arts?** – by **JungHyun Anna Park** and **Sang-Yeal Han** from the Graduate School of Innovation and Technology Management, Korea. This contribution describes the creation of SwarmVision, a system of autonomous robotic cameras that functions both as the basis for an art installation and as an instrument for generating novel engineering research. Through a series of interviews with engineers who examined the project, the authors illustrate how experimentation with the instrument could lead to potential new research directions in computer vision, machine learning, swarm robotics, remote collaboration, and visualization. This suggests that an unstructured and aesthetic approach to research can inform and inspire new engineering research directions, within and beyond the scope of this particular project.

The authors of the third contribution presented their ArtsIT 2014 talk via direct video link from California. It is titled **Generation of Engineering Research Directions through Artistic Process**. The authors are **Marco Pinter**, **Danny Bazo**, **George Legrady** from the University of California, Santa Barbara, and **Angus Graeme Forbes** from the University of Illinois at Chicago. This contribution describes the creation of SwarmVision, a system of autonomous robotic cameras that function both as the basis for an art installation and as an instrument for generating novel engineering research. Through a series of interviews with engineers who examined the project, the authors illustrate how experimentation with the instrument could lead to potential new research directions in computer vision, machine learning, swarm robotics, remote collaboration, and visualization. This suggests that an unstructured and aesthetic approach to research

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<sup>1</sup> Text not included due to a previous publication with same content by same author.



can inform and inspire new engineering research directions, within and beyond the scope of this particular project.

The fourth text is by **Jelena Guga** from the University of West Bohemia, Czech Republic and is titled **Virtual Idol Hatsune Miku: New Auratic Experience of the Performer as a Collaborative Platform**. In this contribution, the phenomenon of virtual idol Hatsune Miku is analyzed in the context of critical theory, emerging technologies, and theory of digital art practices. The first part focuses on the phenomenon of the virtual celebrity seen as Deleuze and Guattari's concept of 'body without organs.' The second part examines how the state-of-the-art technologies have enabled the existence of Hatsune Miku who is simultaneously a corporate software product, a pop icon, a performance artist, and a collaborative multimedia artwork. Based on the reading of Hatsune Miku as a hybrid product emerging from the fusion of arts and IT, the last part revolves around the concept of 'aura' (Benjamin) generated by virtual idol's presence. Finally, the notion of hyperterminality is introduced not only to differentiate between entities/identities appearing on the surface of the screen and those virtual constructs coexisting with us in the spaces of physical reality, but also to explore how these newly emerging "phygital" entities transform the existing conceptions of body and identity.

The fifth piece is **Traditional Painting Revised: The Ambient Intelligence Approach to Creativity**. The authors are **Nikolaos Partarakis**, **Margherita Antona**, **Emmanouel Zidianakis**, and **Panagiotis Koutlemanis** from the Foundation for Research and Technology, Hellas, Institute of Computer Science, Greece; and **Constantine Stephanidis** from the University of Crete, Greece.

This contribution presents how today, many forms of art are influenced by the emergence of interactive technologies, including the mixing of physical media with digital technology for forming new hybrid works of art and the usage of mobile phones to create art projected on public spaces.

Many artists and painters use digital technology to augment their work technically and creatively. In the same context many believe that the time of transition from traditional analog art to postmodern digital art, that is, to an art grounded in codes rather than images has arrived.

The research work described in this contribution is offered toward supporting, through the use of Ambient Intelligence technologies, traditional painters' creativity, as well as methods and techniques of art masters. The text presents the design and implementation of an intelligent environment and its software infrastructure, to form a digitally augmented Art Workshop. Its practical exploitation was conducted in an Ambient Intelligence (AmI) simulation space and four feasibility studies were conducted. In each of these studies an oil painting was created following an alternative, yet accredited by artists, approach.

The sixth contribution is **When Technology Collaborates: Politics and the Aesthetic of "We" Human-and-Technology** by **Hyunkyung cho** and **Timothy W. Luke** from Virginia Tech, USA and **Joonsung Yoon** from the Global School of Media, Soongsil University, Korea. This essay proposes "We" human-and-technology as the new human identity performed by the collaborative action of human and technology. Its aim is to open a new way for intersections of art, technology, and humanities, through the political and aesthetic intimacy of human and technology in the

collaborative action based interdependent perspective. “We” human-and-technology emphasizes the process of when the collaborative action of human and technology is performed. It shows that technology as power and knowledge relations intervenes on the knowledge system, in particular, the binary frame reinforcing a mutual degradation between human and technology, thought and action. In the collaboration of “We” human-and-technology, technology’s interventions focus on two ideas: enframing and the fetish. The former presents that the binary frame is an inversion. It uses an instrument for ideology subordinating both humans and technology into the instrument. The latter reveals that the binary frame of “Us” versus “Them” governs our senses through the fetish as blinded practices and beliefs. It implies that how the instrumental understanding of technology conducts the fetishism distorting relations between human and technology.

The seventh contribution is by a Korean team from the Graduate School of Innovation and Technology Management, namely **Bahng So Jung, Yoo Doo Won, Hutchings Patrick, Shi Chung-Kon, and Wakefield Graham**. It is titled **Poetry of Separation: The Aesthetics of Spatial Montage and Generative Editing for Multi-Layered Screens**.

‘Poetry of Separation’ is a media artwork that utilizes an algorithmic generative editing system that selects shots in real time to be rendered over four screens arranged in layers. The authors inform how editing in cinema reconstructs images by montage, deriving meaning from the juxtaposition of multiple shots. Although multi-screen projections have been used to present sectional montages that stress the simultaneity of events, spatially separated screens can disrupt attentiveness and affective involvement; the layered architecture avoids disruptive fragmentation. The generative editing system selects shots for the layered screens stochastically, with authorial constraints and probabilities using predetermined shot criteria. Narrative flow and authorial intents are not damaged due to these criteria, but nevertheless unexpected effects arose from the stochastic system. Conclusions determine how authorial intentions of improvisation and separation in the film content of ‘Poetry of Separations’ find resonance with the automatism of the generative editing system and multi-dimensionality of the screens.

**Technologies Expand Aesthetic Dimensions: Visualization and Sonification of Embodied Penwald Drawings** is the title of the eighth text by **Myounghoon Jeon, Steven Landry, Joseph D. Ryan, and James W. Walker** from the Michigan Technological University, USA.

Even though defining art gets more and more difficult, reintegrating art and technology seems to be a clear trend. This text presents how technologies can expand aesthetic dimensions of artworks through Michigan Tech researchers who collaborated with world-renowned artist Tony Orrico in an immersive virtual environment. In the performance, multiple cameras tracked the artist’s body movements and physiological devices logged his biosignals (respiration, heart rate, etc.). The authors report on how the system translated the data into visualization and auditory feedback. Incremental aesthetic dimensions (representation-performance, 2D-3D, outside-inside) obtained based on this art-technology collaboration are discussed with reference to ongoing research.

The ninth contribution is from Denmark and titled **Exploring Felt Qualities of Embodied Interaction with Movement and Sound**. The authors are **Cumhur Erkut** and **Sofia Dahl** from Aalborg University alongside Independent Dance Artist and Choreographer **Anu Rajala-Erkut**.

This text presents approaches for teaching and designing embodied interaction in collaboration with a contemporary dance choreographer. Approaches are based on the felt qualities of movement, providing a shared experience, vocabulary for self-expression, and appreciation for movement as a design material for interaction design practitioners. In parallel, such activities provide art professionals competencies for new contexts. The authors present two workshops conducted at different times, the first in 2009 and the second in 2014. Novel sonic interaction paradigms, technologies, and artifacts were the focus. Subsequently, the development of interactive sketches by pairing observations with motion tracking became the research focus. The activities from these workshops are presented, and reflected upon in this text, in particular, how the investigation evolved questioning whether or not these activities guided the participants from the prevailing notion of command/control in embodied interaction toward experiences related to the felt qualities of movement.

The tenth contribution is a sole authored piece by **Annabel Clarence** from Mills College, USA, is titled **A Proposal for the Creation of a Dance Ontology**. In this text, the author proposes to outline collective dance consciousness into a dance ontology that would allow for a more informed and productive academic discourse, as well as the opportunity to expand ideas to an international stage. The author posits that this concretization of knowledge will elevate the study of dance history, theory, and performance to a higher level of discourse, allowing comparison and conceptual synthesis with more frequency and ease by utilizing the sophisticated structure of semantic web-based ontologies, the dance world can maintain minutia while simultaneously expediting its discussion. It is suggested that through the exploration of the construction of an open-access dance ontology, the similarities between dance, which utilizes people as its medium, and information science, which utilizes binary as its medium, will come to the surface and subsequently shed light on how data-based discussion can help advance dance as an academic discipline.

The eleventh piece in this book is titled **Interactive Internet theatre (Interactive multimedia solutions at the New Aleksandrinsky Theatre Stage)**, authored by **Nikolay Borisov**, **Artem Smolin**, **Denis Stolyarov**, and **Pavel Shcherbakov** from the St. Petersburg National Research University of Information Technologies, Mechanics and Optics, Saint Petersburg State University.

In this piece, the authors present how on May 15, 2013, in St. Petersburg, Russia, a new cultural venue, New Stage of Alexandrinsky Theatre, was inaugurated; the hi-tech show complex comprises three separate buildings united by one lobby. The main purpose of Alexandrinsky complex is to introduce experimental stage solutions that require intense usage of modern multimedia technologies. One of the Center's key activities is the use of interactive Internet Theatre technologies. The term interactive Internet Theatre is explored in this text, as well as the experience of introducing various IT solutions into stage work, based on the cooperation between the University of Information Technologies, Mechanics and Optics, Alexandrinsky Theatre, and St. Petersburg State Academy of Performing Arts.

The twelfth contribution is **Design of a non-intrusive augmented trumpet** by authors **Claudia Rinaldi** and **Luigi Pomante**, from the Center of Excellence DEWS, University of L'Aquila, Italy.

This piece describes the design and first prototype implementation of an innovative concept of augmented instruments where the main idea is given by the opportunity offered by cameras and image recognition algorithms, to avoid the use of intrusive and often wired sensors. This latter aspect, according to the authors, is indeed one of the main limitations to augmentation since also interested players usually try to avoid “external elements” on their priceless instruments.

**Digital Creativity: Children’s Playful Mastery of Technology** is authored by **Eva Petersson Brooks** and **Anthony Lewis Brooks** from Aalborg University, Denmark. This text reports on a study exploring the outcomes from children’s play with technology in early childhood learning practices. The contribution addresses questions related to how digital technology can foster creativity in early childhood learning environments. It consists of an analysis of children’s interaction with the IBM ‘Kid-Smart’ furniture focusing on digital creativity potentials and play values suggested by the technology. The study applied a qualitative approach and included 125 children (aged three to five), 10 pedagogs, and two librarians. The results suggest that educators should sensitively consider intervening when children are interacting with technology, and rather put emphasis into the integration of the technology into the environment and to the curriculum in order to shape playful structures for children’s digital creativity.

The fourteenth contribution to this book is titled **Authoring of digital games via card games: make playful play happen**, which is authored by **Andrea Valente** from the Maersk Mc-Kinney Moller Institute, University of Southern Denmark and **Emanuela Marchetti** from Aalborg University, Denmark.

The authors present how literature and previous studies show that creative play is easy to emerge when children interact with tangible, low-tech toys and games than with digital games. This paradoxical situation is linked to the long-standing problem of end-users’ (or players’) authoring of digital contents and systems. In the text a new scenario is proposed in which trading card games help making sense and redesign computer games, to support players express themselves aesthetically and in a highly creative way. The text further explains how the aim is to look for a middle ground between players becoming programmers and simply editing levels with the main contributions being to show how card games can represent digital games, how playful play can emerge in card games and digital games, and to begin defining a new way to express game behavior without the use of universal programming languages.

**Kristoffer Jensen** from Aalborg University, Denmark authors the next piece titled **Large-Scale Analysis of Art Proportions**, which questions the truth of literature that tries to impute mathematical constants into art via a large-scale study consisting of 11 databases of paintings and photos (around 200.000 items).

Presented is how the analysis, consisting of the width/ height proportions, shows a value of rarely, if ever, one (square) and with majority of images having a proportion larger than one, but less than e.g., the golden ratio. Furthermore, the author states how more images have inversed proportions, meaning that portrait paintings are more common than landscape paintings. The inverse is true for photographs, i.e., the research

shows how more landscape than portrait format photographs have been found in the databases.

The final contribution in this book is **Augmented Sculptures: What You See is not What You See** is authored by **Selçuk Artut**, from Sabancı University, Turkey, who presents his museum installation that explored Augmented Reality Technologies as it enhances our ability to perceive a location with additional 3D visual elements where a point of interest becomes meta-constructed with the addition of extended layers via augmented space elements. The author posits that Augmented Reality presents a virtually enriched version of a visually noticeable reality world that already exists and can easily be seen. In this text, in addition to questioning the representative existence of the art object in the work of art called “What You See is not What You See”, which is created by Augmented Reality technique, the methods being followed for Augmented Reality production technique are examined in detail.

Notable was that concluding the ArtsIT 2014 International Conference was a roundtable discussion hosted by Luis Miguel Girao working closely with the European Commission in Brussels, who is leading a study titled **ICTARTCONNECT**. Discussions focused on the growing consensus that for innovation to happen the critical skills needed - in addition to strong technical and scientific skills – are creative skills, - out-of-box thinking, and capacity for communication and collaboration. Trends are in convergence of all domains of knowledge, and how the Arts are gaining prominence as a catalyst for radical transformations of R&D&I practices. More generally, working creatively is seen as a way to connect values related with (physical) forms and (social) processes. It was concluded how it is timely to analyze how these developments can be best taken up in research funded by the European Commission.

We received 25 submissions for this Conference and only 16 high-quality papers were accepted for the publication.

April 2015

Anthony Lewis Brooks

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