# Divergent Generative Art Practices

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## Abstract

The aim of this panel session is to analyze and compare possible new venues, media, methodologies and forms that generative practices are taking today. We claim that a combination of analytical, playful and critical approaches in understanding and using technologies is important in today's art world. The discussions will start by addressing the creative and cognitive aspects of procedural fluency in creating, reading or interpreting a generative artwork. By assessing the perceptual interaction with generative art, we will continue to question the narrative and performative qualities of this relatively new form. These two sections will introduce us to the contemporary smart cities as venues for generative practices and a notion of engaging city dwellers to participate in this complex system of networks and devices. Furthermore, we will discuss the new potential divergences of generative art practice. Biotechnology and quantum mechanics open another unimaginable field of generative activities that, equally to other venues, require critical, analytical and creative use of technology.

## Get Lucky: Cognitive Aspects of Generative Art

This section addresses the creative, cultural and cognitive aspects of symbolic and procedural thinking in contemporary generative art. Generative art is perceived broadly, as a heterogeneous realm of artistic approaches based upon combining the predefined elements with different factors of unpredictability in conceptualizing, producing and presenting the artwork, thus formalizing the uncontrollability of the creative process, underlining and aestheticizing the contextual nature of art. [1]

The introduction provides an overview of generativeness as one of the key factors of art making, and outlines the characteristics of generative art such as the planned inclusion of chance and indeterminacy, the cognitive tension between the banality of pre-planned systems and their surprising outcomes, the idea of the complex artwork realized in the form of research or study, and the idea of the art as a ludic, proto-, or pseudo-scientific experiment. [2]

The central part covers five specific topics in contemporary generative art by presenting the exemplary art projects and commenting on their conceptual, technical, methodological and poetic qualities. The examples are in complex interrelations and are distinguished by the artists' abilities to transcend the formal, expressive and aesthetic scope of code-based art making, and to maintain the experimental flavor in thoroughly produced projects. *Transcoding* looks at the reflections of early Nam June Paik's hacking and transmedia imagination in generative art today. *Crowdsourced Remix* addresses the principle of combining the programmed regularity or randomness with the (un)predictability of human input.
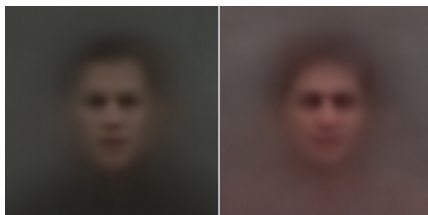


Fig 1. *Portrait*, 2013, Shinseungback Kimyonghun, digital prints, courtesy of the artists.

*Distracted Computer Vision* addresses the various generative uses and 'abuses' of computer vision and machine learning, which offer new perspectives for the critical assessment of traditional visual skills based upon the profiled observation and selective depiction. Working with the advanced image processing solutions such as the Convolutional Neural Networks, some generative projects illustrate broader functional similarities between the CV software and human mind. *Selective Semantics* addresses the generative artworks which emphasize the applied quantification of phenomenological qualities as one of the main features of digital culture. *Escalation* addresses the generative exploration of the effects of infinitesimal accumulation and sporadic disruptions of the monotonous build-ups.

The final part focuses on the functions, challenges, cognitive requirements and creative implications of procedural fluency as (a less complex) one of the two structural modes of thinking in the development of generative art projects. [3] It states that the successful generative artworks are powerful cognitive tools because, beyond their narratives, they motivate innovation, invention and creativity in general by revealing their background thinking processes in a less abstract and/or more engaging way than traditional artworks. They efficiently communicate the ludic cognitive drive as a topological layer of creativity that comes before scientific and artistic method, and encapsulate specific intellectual energy which can be engaged implicitly or explicitly and incite original, often surprising, configurations and ideas. By investigating the uncontrollability, the contextual and participatory potentials of the creative process, generative digital art can also motivate deeper appreciation of the responsibilities intrinsic to innovation, invention and experimentation in general, and consequently to the political, economic and social enterprises. [4]

## Emerging Narrative Forms and Bit Sensation

This section discusses the types of emerging narratives that appear in creative generative practices. This study illustrates various unique artistic methods from the world of digital art, computer games, film and interactive media that lead to new narrative divergences. These methods and poetics are analyzed in relationship to a computer *bit*, whose nature largely influences our creative expressions.

A *bit* becomes a unit or a term to metaphorically address and encompass the reduced and abstract form that is often present in generative practices. Our growing sensation and constant interaction with bits that are taking various forms lead to more and more reduced forms, structures, and minimalistic creative expressions. The generative aesthetics with their cold, synthetic and non-figurative forms enable new spaces for creation of unique sensual experiences that lead to narrative transformations.

The following occurrences in the changes of narrative forms are explained: dichotomy in database driven generative expressions, importance of referentiality in projects that focus on transcoding, and gaining popularity of the meditative narrative escapism. In the first part of the thesis, a type of structural dichotomy is examined that exists in numerous generative narratives that are driven by a user. In the examples: *Dear Esther*, a computer game by Dan Pinchbeck and Robert Briscoe, or *Bear71*, Interactive documentary by Leanne Allison and Jeremy Mendes, we recognize elements like naturalistic voice over and abstract visual interface that are creating the dichotomy which does not reduce the overall quality of user experience but it rather enhances it. In both projects, users willingly conform to the rules of the work, and to the dichotomy. As a result, the whole system enhances our sensations and love for the reduced picture/form, our sensation for the *bits*.

Second part claims that generative works often must include a point of a reference, or some information about the work without which a narrative would cease to exist. In collaborative project *Forms,* visual artists Memo Akten and Quayola translate the movement of human body from various athletic performances and visualize them with abstract forms. Here, the artists use the extremes of body movement as a reference that a spectator also sees in order to try to match these movements with dynamic flow of particles. The live video recording here works as a reference and which enables us to ultimately point our focus on the beauty of the data and this procedural animation. Interestingly, the body movements and its abstract transformations form a dichotomy similar to the one discussed in the database narrative section.

The third part deals with meditative narratives, which are characterized by day-dreaming, explorative and stimulating effects and which also can be explained as results of our growing sensation and love for computer bits. In *Journey,* a game developed by *thatgamecompany*, the joy of being in the open world of generative landscapes is much more engaging than the uniqueness of its narrative. The player is invited to meditatively explore the world and once s/he enters the world, there is no going back out of this beautiful and mesmerizing magic circle.

To conclude this section, we analyze the project *Sound of Honda/ Ayrton Senna 1989* and its relationship to the novel ways of representation, representation with data. This method is creating completely new venues, not only generative art, but for other art forms, as well. What stays important for the new creators is to truly believe in data that they are working with. As Caspar David Friedrich would put it: "A picture must not be invented, it must be felt."

## Performing Systems

In recent years computational and screen-based art has flourished within the digital arts world and has since had great influence across multiple disciplines. Fuelled by

explorations into the beauty of algorithms and their translation into ever emerging visual outcomes, artists working with generative systems have created a substantial body of work and sets of tools using desktop and laptop machines. With the recent arrival of a multitude of mobile platforms, small systems-on-a-chip and electronic devices the potential for new tools, artistic expressions, transdisciplinary investigations and interdisciplinary collaboration is imminent.

Technology and networks had become an ubiquitous part of our urban lives. With easy access to hardware and software, the availability of technology for everyday activities had now become the norm and defines the conditions in which we live, play and work. How will these new conditions and systems influence and shape future art practices and interdisciplinary projects?

In this presentation, 3 approaches are present that are concerned with the investigation and application of such new systems within education, performance, and urbanity. How do system-based strategies and technology driven interactivity affect the implementation of dance and audio-visual performances? How can generative strategies be applied within a Fine Arts context and alter the production of art works? How can custom-built tools be used to explore, analyze and navigate an urban landscape?

On the basis of three case studies, this presentation will provide a brief insight into the process, the difficulties and new findings of system-based art-making within and across different art practices and disciplines.



Fig 2. *Urban sampling tools*, 2015, Urban Explorations project, courtesy of the artists.

## City Made of Software

Contemporary city is ultimately grounded in and operated by software-supported devices that become skillfully blended within the environment and our everyday lives to such an extent that they are probably more accurately described as 'second nature'. Cities now operate through the use of mobile networks; sensors that are embedded not only in our smartphones, sustaining and encouraging self-monitoring, but also present within architecture and street furniture; and, of course, online delivery platforms that facilitate information exchange. Software and code,

therefore, as a kernel of pretty much every technological device today, augment, supplement and facilitate people in their daily tasks and routines to the point, as Thrift and French argue, we may rather speak of automatic production of space. [5] Dodge and Kitchin define this software-mediated spatiality, the one in which code contributes to complex discursive and material practices producing eventually complex spatiality as "code/space." [6]

Location-based services and information delivery platforms in particular are envisioned as the next utility network, presented by developers as empowering tools to presumably 'enhance' user's experience of space through automatic sensing and real-time interpretation of available information. Artists working in the field of locative media art were among the first to utilize location-based technologies in an effort to experiment with new spatial experiences. On one side, they have been engaging with locative and ubiquitous technology through research in engineering and designing practice; on the other, they have been rethinking urban issues and spatial concepts moved by the 'spatial' attributes and contexts of use of such technologies. McQuire acknowledges artists' efforts and experimentation crucial for driving the thoughts "about facilitating other forms of engagement in public space." [7] He recognizes the significance of the artists' exploration within the field of new media as the valuable theoretical ground to stress the possible (mis)uses and future trajectories of the technological development. Drawing on Sennett's ideas of urban value in 'ritual and play,' McQuire claims that such play will test and potentially reinvent social rules. [8] Similarly, Crang and Graham see art practice as a model that should, or could, inspire a different approach to technologies, in other words 'appropriation,' in place of submission, encouraging new forms of public action and social contact such as multi-authored coding. [9] According to authors, the art and activism in the field of locative media in particular attempt to embody such practices that re-enhance and reanimate the city, and the role of location-based media is to boost this potential of everyday practices, amplify and encourage 'performative' power of everyday life to re-claim and negotiate spatiality. We should recognize artists' work as an attempt to render data and coding environment transparent and aesthetically problematic, and as such make create oppositional vision of urban space: "[Artists] intention is not the creation of perfectly known environments but "destabilization of spaces" achieved by preserving 'human link' to a place by recording and sustaining the personal and transient meaning of places." [10]

This 'call' for the conscious and subversive personal perceptions, as can be seen in many examples of locative media artwork also originate from 'psychogeography' and related concepts. [11] Conceptualized long before location-based technologies set on the scene, theorists and artists gravitating to Situationist International developed and advised a number of subversive strategies to help 'urban strollers' construct such personal

experience of urban space. Among strategies was Debord's concept of derive defined in 1958 as a "playful-constructive behavior and awareness of psychogeographical effects, and are thus quite different from the classic notions of journey or stroll", which would serve as a drive for more critical approach to imposed spatiality. [12] Similarly to 'psychogeography,' locative media artist suggest new models for more critical engagement and active participation in urban space of city dwellers.

Examples vary from individual contributions in the form of critical annotations and inscriptions, to visualizing "the city built of data," [13] in which new infographic and mapping techniques may bring awareness of certain issues. Many of the artists' generated maps reveal inconsistencies in the power systems, and, as such, present a valuable critique to those in power. Such are so-called "Hertzian space maps" that visualize the 'true' dispersion of wireless networks and coverage, showing that wireless Internet connection accessibility vary within the "Hertzian landscape" even in the most 'connected' cities in the world. [14]

More recently, sensors, real-time space monitoring and increased computational power put into the hands of the users, were said to pave the path towards user-generated, and "co-created" cities:

"It is possible to give shape to a scenario in which the concepts of citizenship and political representation can be reinvented, tending towards a vision in which people can be more aware and benefit from added opportunities for action, participating in an environment designed for ubiquitous collaboration and knowledge which is multi-actor, multi-stakeholder, in real-time: the city." [15]

As such, the proposed concepts should not just represent technical skills to operate and build monitoring systems of one's environment, but a community of citizens who will employ a critical approach to 'monitoring' environment when they connect, share and discuss their results, be it for individual or collective goals. This alternative multilayered urban space that co-users of location-based media would create, not only detect and visualize urban issues but also encourage its users to further become actively involved in critique and any potential changes.

## Artistic Strategies in Generative Art Practices

In Husserl's "Phenomenology of Embodiment," the body is not an extended physical substance in contrast to a non-extended mind, but a lived center of experience, and both its movement capabilities and its distinctive register of sensations play a key role in his account of how we encounter other embodied agents in the shared space of the life-world. The phenomenological maxim - to the things themselves - as well as the concomitant task to reveal the world, has to be done by observing the forms of media and the life-world of communication. This multi-levelled experience includes the electronic flow of information as wavelengths and physical particles as part

of the equation. Thus, Generative Art offers a unique opportunity for the recapturing of the relations between humanity, technology and the environment as we find today that the phenomenological folding of embodied and mediated space into felt space or experienced time represents a multi-nodal structure of space, bodies, time, and otherness simultaneously.

Generative Art has gone through multiple transformations, referring to noise art, fractals, glitch, robotics etc. It has affected video, the Internet, and every possible technological form. Marshal McLuhan once said, "Each new technology is a reprogramming of sensory life."

Mark Amerika's work from 1997 "GRAMMATRON" experiments with online hypertext narrative, Net Art, and digitally expanded cinema. He was able to construct an alternative art experience investigating the positioning of reader-subjectivity in computer-mediated cyberspace. The work represented an early experimentation with Graphical User Interfaces (GUIs), inviting the visitor to navigate through the narrative and networked environment, thus remixing alternative discourses (the author points out to retelling of the Golem myth remixed with cyberpunk, dialectical materialism, and California ideology, to experimental narrative riffs from the likes of James Joyce, Arno Schmidt, and Jean-Luc Godard).

In 1997 Jacques Servin (aka Andy Bichlbaum, one of the leading members of The Yes Men), a well-known programmer who hacked SimCopter, an action game from the makers of SimCity, creates BEAST(TM), by sampling an immersive environment by sampling texts from Benjamin to Benn, as well music loops stolen from various programs including the Windows system, integrated into a what was at the time monster Java applet.

Mark Amerika's *Mobile Phone Video Art Classics* (2008) investigates the emergence of digitally constructed identities and reedits art history by using low-tech mobile phone technology and simple iMovie software. Salvador Dali, Bruce Nauman, Mark Amerika, Nam June Paik, Baby Jane Holzer, Susan Sontag, Marilyn Manson, and Madonna all star in it.

Mark Amerika's *Crapshoot* (2015), an artistic web application developed especially for electronic tablets, is an interactive poetic generative re-mix that mimics the form of Stéphane Mallarmé's poem *Un Coup de Dés Jamais N'Abolira Le Hasard* (*A Throw of the Dice will Never Abolish Chance*). Instead of rolling the dice the participants have to swipe the screen.

However generative activity has not stopped there. Bio-informatics and Nano-technology have been looking into the atomic and subatomic levels as a result shaping biological life forms. The codes of life have been unraveled, by mapping tens of thousands of human and other genes. The ability to code life into symbols, and being able to interpret these symbols has changed the very notion of what we understand as life and how we are able to interact with it. Eugene Thacker sees the triumvirate of encoding, recoding, and decoding as representing the primary activities of Biotechnology

today. He points out to the simultaneous notions of the biological stock being property and information, having the traits of materiality and immateriality, existing as deployments of life which are being shifted from body to body, body to code, and code to body. This same tripartite division is also a political-economic one as well. In a sense, encoding is synonymous with production, for it is in the process of encoding the biological that the Biotech industry is able to accrue profits (as intellectual property, as a proprietary database or software). Recoding is then synonymous with distribution (and its related term circulation), for the practices of bioinformatics, database management, and computer networking are predicated on the ability of biological information to be widely distributed and circulated. Finally, decoding is synonymous with consumption in that, in a medical sense at least, it is in the final output or re-materialization of biology that biological information is used, consumed, or incorporated into the body.

In the past 15-20 years artists have started to use Biotechnology, and entered Quantum and Nano-research. Merleau-Ponty's idea that Phenomenology is the study of essences resounds very well with Bio-tech Artworks, such as Eduardo Kac's "Genesis". Namely, Phenomenology demands the reinterpretation of the world as we interact with it through an immediate experience. In this sense of the 'lived space' we can look into Eduardo Kac's transgenic installation "Genesis", which explores the new fetish of the biotechnological world: the gene and the protein, posing interesting theoretical and metaphysical questions about media, meaning, and representation. The key element of the installation is an 'artist's gene' which is a synthetic gene containing a DNA sequence of the first chapter in the Old Testament (the Biblical book of Genesis), its translation into DNA bases, and the subsequent reversing of the process by translating from the mutant gene sequence, to Morse code, and finally back to altered English. Participants in the project (both in the gallery space and on the web) can turn on the ultraviolet light in the gallery, causing real, biological mutations in the bacteria to be found in the Petri dish in a luxurious glass case. The viewer is thus able to change the biblical sentence in the bacteria. This relates to Eugene Thacker's triumvirate of encoding, recoding, and decoding as representing the primary activities of Bio-technology today, as well as to the simultaneous notions of the biological stock being property and information, having the traits of materiality and immateriality, existing as deployments of life which are being shifted from body to body, body to code, and code to body.
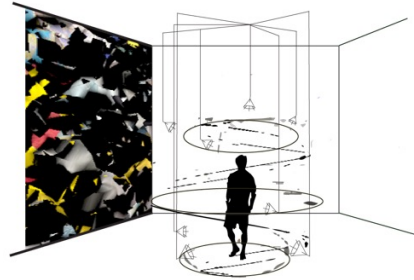


Fig 3. *Quantum Consciousness*, Paul Thomas and Kevin Raxworthy, 2015, courtesy of the artists.

In terms of quantum and Nano-research, it is worth pointing out to Paul Thomas and Kevin Raxworthy, who have created works of art such as "Nanoessence" (2009), where life is examined at a sub cellular level, and the humanistic discourse concerning life is challenged by nanotechnology, where the viewer interfaces with the visual and sonic presentation through his/her own breath. Thomas and Raxworthy have also created "Quantum Consciousness" (2015), experimenting thus with the imaging and materializing of impossible states of quantum matter and the co-emergence of human consciousness. The scientific data for this project is generated from a microwave signal, which transforms a reading of Richard Feynman's paper on the birth of the quantum computer.

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