# 21 Games for the 21st Century

**ANDRÉ SIER**[1]

## 0. SETUP(){

Since 1997, I am running a small electronic arts studio, s373.net/x, dedicated to my arts practice, exploring intersections between art, games, interaction, immersion, mathematics, poetry, cyberspace, and machines. This text is based on a keynote address during the conference "VideoJogos X" that took place at Almeida Garrett public library, in Porto's Palácio de Cristal, on the 21st November 2018. Therein, I proposed 21 Games for the 21st Century, which I have built in the new century's early years. Looking back, the selection could differ in some minor details, some pearls were eclipsed, but nevertheless, under shinned, the ones presented are representative of the main points driving this article.

Games. Games seen as interactive logical ludic constructs targeting alternative directions other than mainstream triple a gaming or even indie gaming tends to focus on. Art Games, Proto Games, Ambient Videogames, Not Games, Immersive Cyber-environments. As stated on a 2016 article at *Cibertextualidades* (2016b), my main fascination with videogames lays in its technical apex of computation by running programs on computers, as well as its integration of multiple artistic disciplines: "Videogames merge sciences, arts, engineering and logic to provide a virtual time-space continuum, closer to the experience of alternative experienceable realities." (2016b)

My arts practice, after studying music, painting, sculpture, philosophy, has mutated into exploring computation and its intersections with arts. Inspired by early contact with videogames, fascinated with its immersive capabilities, I started delving into computing exploring *techné* and media to create, synthesize, host and navigate cyber-virtual-environments. Programs, ethereal objects that call for

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your actions to unfold their *spatium*.[2] Cathartic otherness artistic laboratories. Human interfaces towards Non-Human worlds to feedback the Human. Artistic constructs refocusing mythological ideas, actualized in the self that experiences and perhaps merges with the proposed ambiance.

## 1. BACKGROUND(COSF(FRAME*5E-4)*127+128);

Back in the late nineteen eighties, with the introduction of consumer-level micro-computers with very limited capabilities (Atari, Commodore, Spectrum), even as a youngling, I was deeply fascinated and engaged at the rudimentary logical constructs, graphics and sounds early game programmers set afoot: by interacting with physical devices I could role play and control on-screen characters with rudimentary graphics, unfold absurd or fantastic storylines, train faster responses to stimulus and increase my dexterity navigating the logical space within a game, while arousing my illusion of actively participating in endless parallel worlds that quickly changed the space around my body by immersing its attention in the videogames being played.

Although my first experiences with gaming and programming were on a Spectrum computer and the BASIC programming language, it was not until the nineties, with the appearance of more powerful commercial personal computers, and of games such as *Wolfenstein 3-D, Doom, Quake* (iD Software, 1992, 1993, 1996), *Unreal* and its editor *UnrealEd* (Epic Games, 1998), that have heightened the immersive capabilities of the gaming experience near a seamless plateau of roaming imaginary and tangible three-dimensional spaces, where I could find the tools to start experimenting building virtual spaces. Here, immersiveness refers not to the modality of human computer interface, but to a strong engagement with the programs' simulations and their innovative recreation of a real-time interactive and vast Cartesian simulated virtual space, usually made by computer graphics and sounds that are interac-

[2] Deleuze's intensive space, an ideal or metaphysical surface, a hyperspace, a plane of immanence where the being and its thinking expresses its full scope. See, for example, Burchill, L. (2007), *The Topology of Deleuze's Spatium*, in Philosophy Today, 51, pp. 154-160.

tive to the players' control (Sutherland, 1965; Baudrillard, 1981; Benedikt, 1991).

These types of games are played in the first person and the player experiences the action through the eyes of the protagonist. Although the FPS (First Person Shooter) gaming genre debuted nearly 20 years before[3] my first experiences, it was usually restrained to non-standard and cutting-edge computational research platforms which were only available at research institutions like NASA or MIT, not to a standard consumer/artist. Affordable personal computers bridged this gap and massified access to games and tools, even though they were written in cryptic logical programming languages with steep learning curves.

First-person 3-D perspective computer graphics have since layered the computational foundations for the recreation of a playable virtual space inside the memory of computers, exposed through a variety of computer peripherals that target the human senses. Videogame users saw the playing field as if they themselves were walking on it, with the virtual game space being rendered in one-point perspective as if seen from the users point of view. These types of early kinds of graphics and immersion could also be considered a very early virtual reality system. But it could also do more. As the father of virtual reality stated (Sutherland, 1965), still echoing years to come:

*A display connected to a digital computer gives us a chance to gain familiarity with concepts not realizable in the physical world. It is a looking glass into a mathematical wonderland.*

Combining these gaming experiences with artistic research in painting, sculpture, music and installation I was already undertaking in the nineteen nineties was an obvious natural step. These early immersive gaming experiences on computers, that initiated first person navigation on vast three dimensional spaces, by using the keyboard and mouse as interfaces on the PC between my body and the virtual constructs, have since transformed my view on what art

[3] In 1973 Steve Colley, Greg Thompson et al programmed Maze War on a Imlac PDS-1 at the NASA Ames Research Center in California. The program depicted mazes on a 16x16 bit resolution that could be navigated from a first-person perspective and shared on a network setting amongst similar machines. [http://www.digibarn.com/history/04-VCF7-MazeWar/stories/colley.html, accessed 21 October 2018].

could be: as an arts student, I quickly extrapolated this immersive quality on computerized ludic constructs to being transported into a traditional art piece's objective space.

Instead of experiencing traditional *static* works of art, by mind playing/wandering with the sense data paintings or sculptures offer, where the eyes and the imagination move according to what some masterpiece is inscribed with, returning a sense of *beyondness*, awe, terror or delight, to name a few, I started picturing what if we could merge art experiencing with videogame interacting? What if we could enter a painting and browse through it, touch it, play with it, dive within it and immerse in the artists piece conception scattered over an interactive virtual space and time? How would we conceive different spaces and mechanics where a concept of a cybernetic, interconnected and limitless body augments the real one and dilutes itself in a cyber-realm? Could these new technologies promote a heightened deeper engaging with themes unheard of in reality? Not that the mere experience of static art masterpieces does not carry along already this game within – of which numerous philosophers and artists have tried to give accounting for –, that countless human-made artifacts through the course of millennia with each epoch's technologies are proof of. But through these new computerized techniques we could almost physically venture into artistic realms, themes, interact and play with them, as no other technique has managed to actualize before, engaging deeper illusions with almost concrete tangibility into navigable, interactive experience spaces, which are distinct from what the body knew so far from its experience in a non-computerized non-augmented reality. New bodies could be forged, with distinct motion characteristics. New (virtual/cyber) spaces could be built. Spaces that could be shared, communicated through networks, bodies that could blend into other lifeforms sharing same cyberspaces.

This idea of a cyberspace, rooted in Norbert Wiener's cybernetics, where in 1948 he defined the cybernetic discipline as "the scientific study of control and communication in the animal and the machine" (Wiener, 1948), provides the infra-structural plateau on top of which such phenomena of shared topologies for human augmentation gain concreteness. It comes as no surprise that an artist pioneering artworks and first embracing these cybernetic grounds tackles the seemingly endless possibilities of these new media as a major leap, both for our understanding of the world and for its impact into forging new arts that could embrace this unbefore seen potential, reviving the ideas of a *gesamtkunstwerk* as con-

ceived by Trahndorff in 1827 and Wagner in 1849,[4] although now set and framed in a cybernetic context. Roy Ascott, in his 1989 text Gesamtdatenwerk, shares with us both of these groundbreaking topics foreseen in their full applicability (Ascott, 1989):

*Increasingly, as artists, we are impatient with single modes of operation in data space. We search for synthesis of image, sound, text. We wish to incorporate human and artificial movements, environmental dynamics, and ambient transformations all together into a more seamless whole. We search, in short, for what I call, in German, Gesamtdatenwerk, or "integrated data work," echoing the Gesamtkunstwerk, or "total artwork," conceived by Richard Wagner.*

Ascott continues to underline the philosophical implications of what such a cyberspace could be, firmly entwined in reality:

*[...] computer networking provides for a field of interaction between human and artificial intelligence, involving symbiosis and integration of modes of thinking, imagining and creating, which, from the point of view of art, can lead to an immense diversity of cultural transformations, and which, in science and philosophy, can yield enriched definitions of the human condition. Computer networking, in short, responds to our deep psychological desire for transcendence—to reach the immaterial, the spiritual—the wish to be out of body, out of mind, to exceed the limitations of time and space, a kind of biotechnological theology.*

*[...] Our perception of space and time is not the frame of reality but an aspect of an undivided whole within which an infinity of separate realities, parallel universes, can endlessly be constructed. How quickly this science moves into metaphysics and brings us back to theology, mysticism, and mythology! It is in this richness of value systems, world models, cultural constructs, and virtual realities that the networking artist operates.*

Another aspect worth highlighting from my early encounters with new technologies and programmed virtual realities is that it also seemed to me that these deeper experiences could change reality rules under a new technological strata, by proposing new ones, or attempting to emulate and play with known ones, and could educate and foster life changing experiences in the virtual that

[4] The term *Gesamtkunstwerk* first appears in Trahndorff (1827), *Ästhetik oder Lehre von Weltanschauung und Kunst*, although is more attributed to Richard Wagner of which he uses this same word-concept in his book *The Art-Work of the Future* from 1849.

would feedback in the user towards a better real. At the time of my first encounters with these technologies I knew of no traditional artists working on such fields. The possibilities mesmerized my senses since.

In the dawn of the commercial Internet I was able to research and experience VRML spaces,[5] early mathematical and software art, tutorials and coding tools which allowed me to learn the rudiments of programming languages, that I have been refining over the years. In the peak of these first technological encounters with game engine tools, they since shifted my interests as an artist from static traditional art experiences towards interactive processes and game spaces. Before approaching virtual space interactivity, and already with keen interests in video manufacturing and electronic sonic processes and music composition, yet in art school, I began experimenting with real-time sound and light installations, which led me to develop, since 1998 and ongoing, the *Struct* series of artworks.[6] It was yet in 1998 that I jumped into the virtual and started building a first interactive experience space for the final work of sculpture at art school. *0 0 255* (Sier, 1999)[7] was a first practical entry point into the arts I have studied, researched, presented works on, ever since.

Games, or the ludic sphere, are inherently present in many aspects of human activity. They are also a powerful tool to convey stories and other experiences which are usually outside a human's normal life. In the seminal work *Homo Ludens* (1939), Johan Huizinga applied game theory to different aspects of human life, outside of the ludic sphere, stating they could be used as tools to everyday aspects of human life. Roger Caillois (1958) built upon and disputed Hu-

[5] VRML stands for Virtual Reality Modeling Language, a precursor attempt to create a standard file format for representing 3 dimensional interactive graphics, designed in 1994 as a runner up to extending the World Wide Web to support virtual reality (Raggett, 1994, https://www.w3.org/People/Raggett/vrml/vrml.html accessed 10 October 2018).

[6] For a research article about the Struct series of artworks please refer to Sier, A. (2017), 'Structs for an aspatial quantum-now', TABOO - TRANSGRESSION - TRANSCENDENCE in Art & Science, Honorato, D., Giannakoulopoulos, A., (Eds), Corfu, Ionian University | ISBN: 978-960-7260-60-4 | URL https://avarts.ionio.gr/ttt/2017/en/proceedings/

[7] *0 0 255* was an interactive audio-visual browsable game space constructed with UnrealEd. The 3D environment offered the player navigation through a joystick in a constructed imaginary space with spatialized sounds and events. A precursor work into the many interactive 3D environments the author has constructed; some images can be consulted at https://andre-sier.com/piantadelmondo/0-0-255/

izinga's emphasis on competition in play, formulating four distinct categories of games: Agon, Alea, Mimecry/ Mimesis, Ilinx. The research I am undertaking focuses on electronic arts constructs and games fostering the disrupting of the human sense of self, thus falling on Caillois's *ilinxian*[8] game category, while trying to expand it to accommodate other distinct subcategories. This vertigo like game-state of ilixian category might be achieved via altering and disrupting the perception of self while engaging the user on a ludic construct, mediated through technology, algorithms, and custom human-computer interfaces.

Videogames are among the most elaborated software programs, which house a significantly large number of procedures in every displayed frame. Running in logical machinical substrates, which control-flow electricity as data information at dazzling speeds through labyrinthine electronic circuitry, following highly complex algorithms, which combine almost all computer's abilities at circa 60 frames per second, almost instantly, providing at human scale and their senses a feasible replica of reality, or engaging other realities. They are also a most effective mean by which, through simple interactive experiences (key stroking, mouse moving, sonic, visual, physical or other input interfaces), it is possible to engage in first-person played experiences, storytelling and even to achieve immersive otherness. "They feedback from life and have the potential to modify the self" (Sier, 2016b).

Videogames, by combining interactive content, become different from other media. Within this medium, like Espen Aarseth (1997) affirms, "nontrivial effort is required to allow the reader to traverse the text". He also states (2001):

*Games are both object and process; they can't be read as texts or listened to as music, they must be played. Playing is integral, not coincidental like the appreciative reader or listener. The creative involvement is a necessary ingredient in the uses of games.*

[8] Ilinx is a category of games and a kind of play Roger Caillois ascribes in his seminal 1958 book *Les Jeux et les Hommes* to a temporary disruption of perception capable of inducing alter perceptive experiences, like vertigo, dizziness, brief acute disorientation. This playful outer body experience resembles key elements of knowledge incorporation, change, Deleuze's foundation of differential ontology.

The interactive activeness remains an essential touchstone in the processes these new media allow: players dive in the imaginary yet tangible virtual worlds, and it is solely through their interaction with the world they progress or incorporate new knowledge. This essential new quality of videogames or deep interactive experiences is referred by Ian Bogost in his book *Persuasive Games* (2007), as equating videogames as a tool towards a new form of education through experimentation on the first person:

*I call this new form procedural rhetoric, the art of persuasion through rule-based representations and interactions rather than the spoken word, writing, images, or moving picture. [...] In addition to becoming instrumental tools for institutional goals, videogames can also disrupt and change fundamental attitudes and beliefs about the world, leading to potentially significant long-term social change. I believe that this power is not equivalent to the content of videogames, as the serious games community claims. Rather, this power lies in the very way videogames mount claims through procedural rhetorics.*

Learn by doing, learn through otherness near embodiment, or by experiencing the actions in our own flesh, virtualized or augmented, remains a powerful and deeper mechanism by which experiences can be shared in a more acute way. Now insert the tape, type Load "" and press play.

## 2. SWITCH (ROMS/PROGRAMS LISTING)

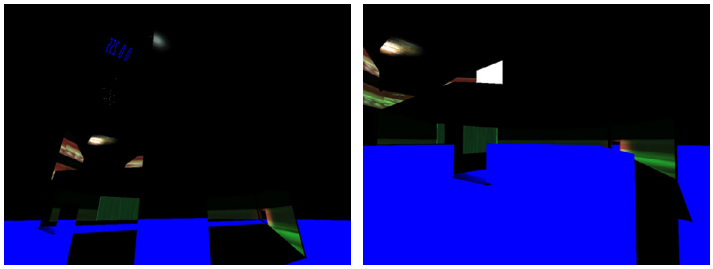
```
switch(game){
    case 00:    0 0 255                 1998/9  ;
    case 01:    747                     2001/2  ;
    case 02:    747.2                   2004    ;
    case 03:    747.3                   2006    ;
    case 04:    k.                      2007    ;
    case 05:    Space Race #1           2007    ;
    case 06:    Space Race #2           2008    ;
    case 07:    Space Race #3           2008    ;
    case 08:    32-bit Wind Machine     2009    ;
    case 09:    k.~                     2010    ;
    case 10:    747.5                   2010    ;
    case 11:    Eer                     2007/11 ;
    case 12:    0 255 0                 2011    ;
    case 13:    577Rhea                 2013    ;
    case 14:    TemporaryBabel2D        2013    ;
    case 15:    TemporaryBabel3D        2013    ;
```

```
    case 16:    747.7                   2014    ;
    case 17:    Skate.Exe               2014    ;
    case 18:    Draco.Wolfanddotcom.info 2015   ;
    case 19:    Atlantis (Sólon Interface) 2016 ;
    case 20:    Phoenix.Wolfanddotcom.info 2017 ;
    case 21:    Wolfanddotcom           2017    ;
}
```
[9]

## 3. DRAW(){

**0 0 255** (1998/99)

This was the first (and only to this date) artistic experience constructed with a game engine editor (UnrealEd). With a title depicting the pure blue color, the work features an interactive audio-visual browsable game space, a constructed imaginary space with spatialized sounds and events, with streaks of abstract concrete space spawning from an endless blue background. It is a precursor work into the many interactive 3D environments constructed since and exploring audio-visual spatialized composition.



Figs. 1, 2
Two viewpoints into the *0 0 255* environment seen from its blue background.

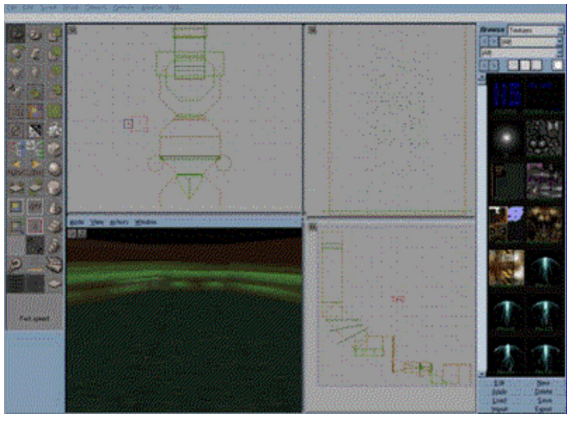


Fig. 3
Backstage view of the built program in Unreal Game Editor.

[9] The attentive programmer will notice int game might fall through due to no breaks;

**747** (2001/2)

First work in the 747 series, made with Max/MSP/Nato and a custom C coded terrain external. 747 is an abstract interactive audio-visual flying machine experience, where the terrain is real-time sound generated from the amplified site-specific sounds of where the work is installed, and players must evade colliding with it, while the speeds increase.

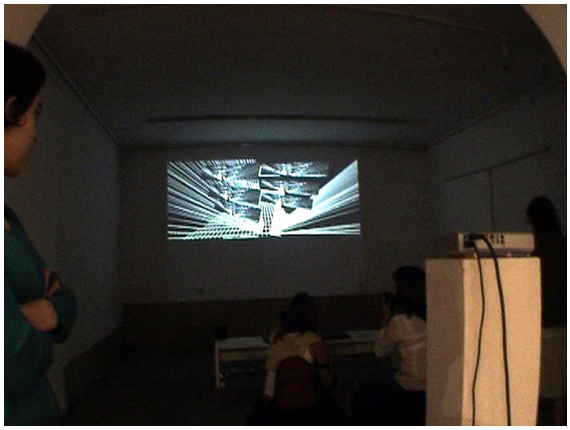


Fig. 4
*747* installed at SoundVisions (2006), Sala do Risco, Lisboa.

**747.2** (2004)

Second piece in the 747 series following the same game logic, this time with quadraphonic spatialized sound output and a couple of terrain spaces, above and below.

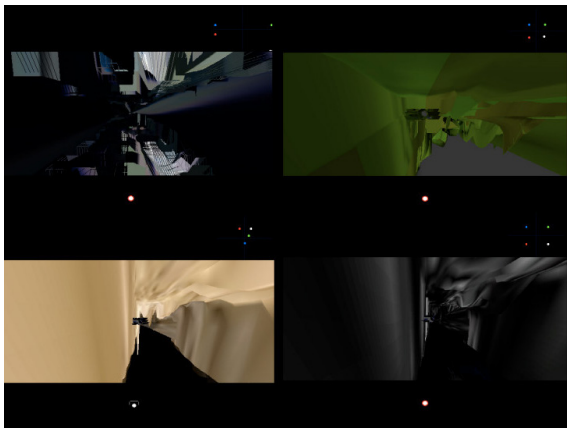


Fig. 5
4 screenshots of *747.2*.

**747.3** (2006)

The third work in the 747 series features a custom computer vision tracking mechanism that is able to invisibly track a users' arms position. With this information from the custom self-built tracker I was able to transform flying human gestures into game commands.[10] Players interact simply by mimicking flying gestures in the active game area in front of the projection.

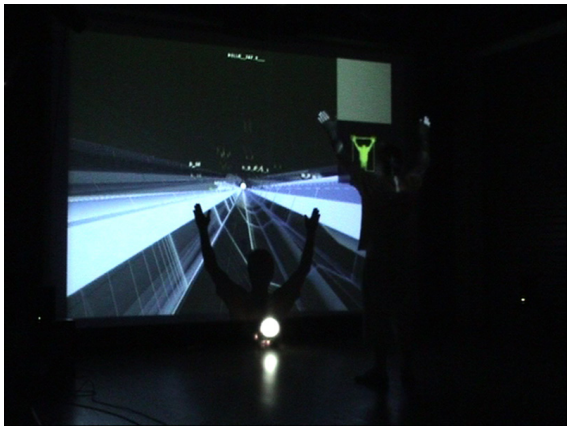
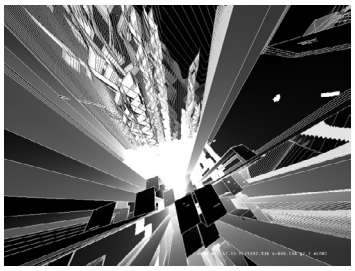


Fig. 6
*747.3* installed at Lugar Comum, Oeiras.

**k.** (2007)

This is a procedural stochastic game with abstract graphics rooted in Franz Kafka's The Castle which attempts to provide the player a pseudo-infinite quest by placing the Castle structure, the player's goal, in only one of the 4,294,967,295 levels of the 32-bit precision random number generator. Game engine programmed from scratch in java/processing

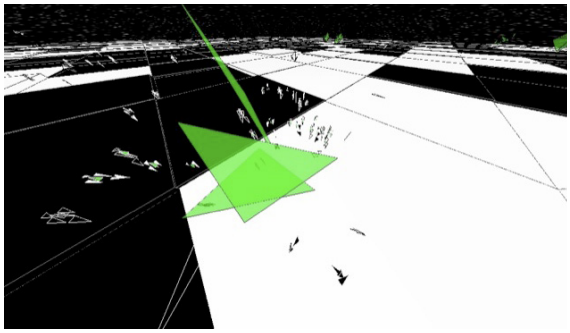


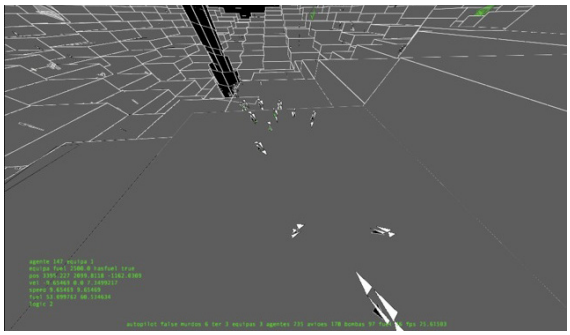
Figs. 7, 8
Screenshots from *k.*.

[10] The algorithm devised specifically for this work was implemented first in Max/MSP under the a-jit.human external (2006) and later in the Flob library for Processing and Openframeworks (2009). For more information see Sier, A. (2016a), 'Human dragons playing in cyberspace', Technoetic Arts: A Journal of Speculative Research, 15:3, pp. 283–96.

**Space Race #1** (2007)

An autonomous self-playing electronic game, where the computer stochastically plays a selected number of computer agent teams which compete for fuel resources to transport them to other planets, within an endless loop.





Figs. 9, 10
Screenshots from *Space Race #1*.

**Space Race #2** (2008)

An abstract game where the user is invited to play, using a joystick, fighting his way through hostile planets populated with autonomous agents that try to take his spaceship. Basically, it's Space Race #1 with high scores, where a human user competes endless hordes of computer teams.

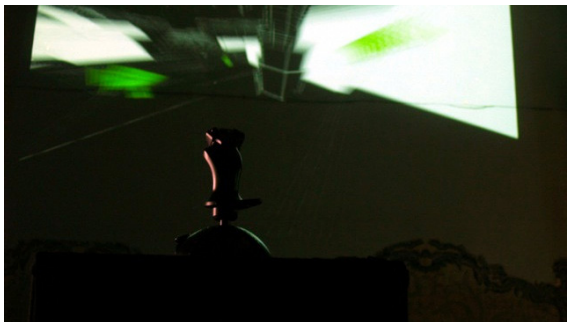
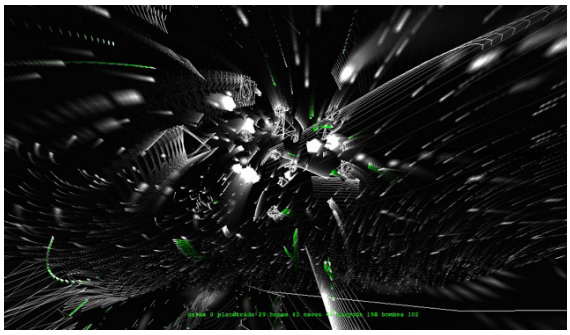
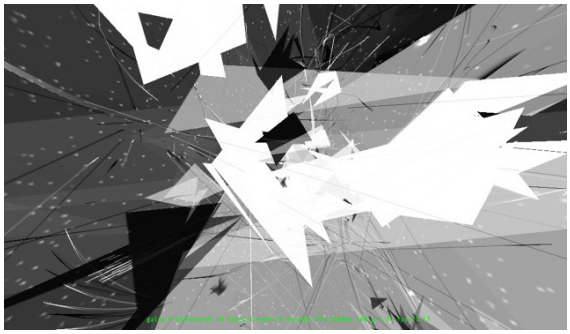


Fig. 11
*Space Race #2* at Festival Eme, Teatro Ibérico, Lisboa (2008).

**Space Race #3** (2008)

A 3d simulation where several simulated humanoid spaceships depart from different planetoids and search the universe in the quest of new worlds, plundering the ones they inhabit. A computer computer game, marks the end of the Space Race Trilogy, in an endless universal collapse.

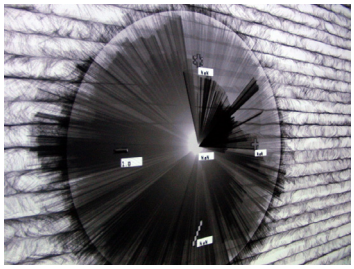


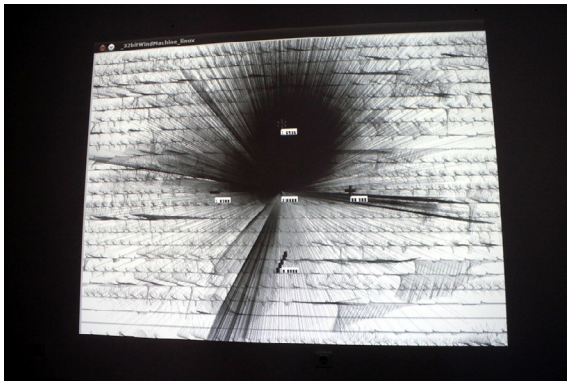


Figs. 12, 13
*Space Race #3* screenshots.

**32-bit Wind Machine** (2009)

A visual mathematical game designed for wind and machine. A wind sensor analyses and emits to a computer the values of wind speed and wind direction. The wind values serve as input to an abstract game where 4 numbers relate with each other with the basic mathematical operations, stepping up as electronic cardinal directions (+, -, *, /). The machine pauses and restarts when the 32-bit limit of the floating point numbers is overflowed, while producing unique drawings.

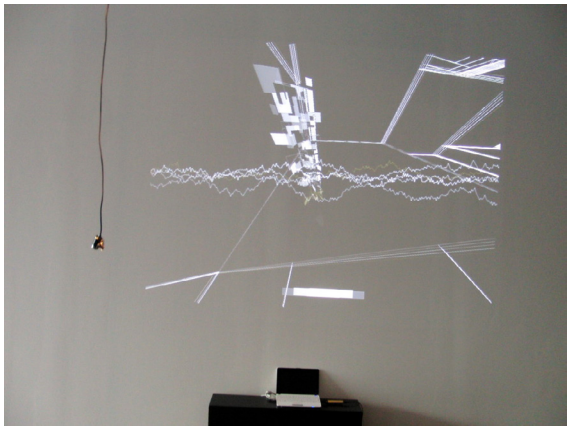


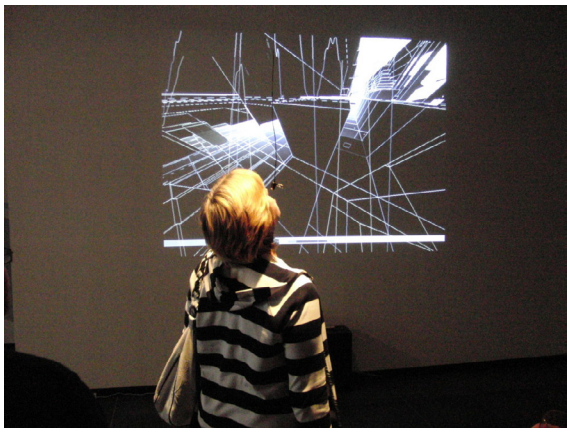


Figs. 14, 15, 16
*32-bit Wind Machine* sensor and visual output, at 64-bits (Who Gallery, Lisboa, 2011) (14,15) and at k.+uunniiv-veerrssee (CCCTV, Torres Vedras, 2012) (16).

**k.~ (2010)**

A sonic land-surveyor of infinite spaces. A three-dimensional voyage in continuous space through sound. A sonic adaptation of k. (2007) where the mouse and keyboard are replaced with a microphone and custom sound analysis algorithm. Users, making sounds above a silence threshold cause k. to move in the direction he is facing. No sounds cause continuous rotation about his axis. Hissing sounds makes him fly.

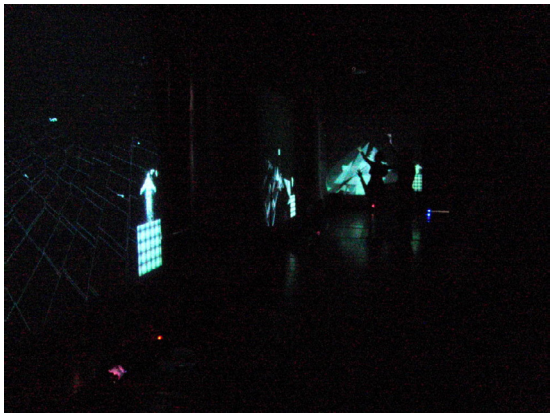




Figs. 17, 18
*k.~* at Ape-x (NT Gallery, Lodz, Poland, 2010).

**747.5** (2010)

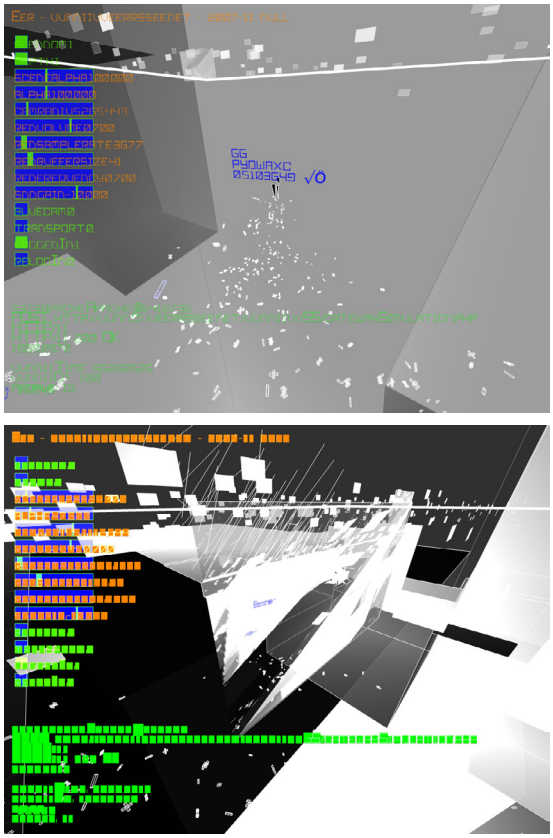
A real time simulation of free flight from the users' bodies; an audio-visual experience where several persons in a local network cross abstract stratospheric skies in a shared virtual space. Unlike *747.3* where players only move forward/sideways, here the virtual space is open and users can fly any direction and meet/crash with each other.



Figs. 19, 20
*747.5* at O Espaço do Tempo, Montemor-o-Novo, 2010.

**Eer** (2007/11)

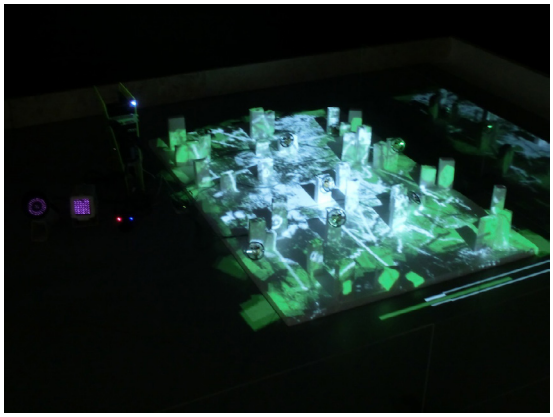
In *Eer* the user is invited, using keys or webcam, to err around the uunniivveerrssee in abstract 3d meta-spaces that gather the various online users, as well as elements of races living virtually inside the code and running in the processor cycles.

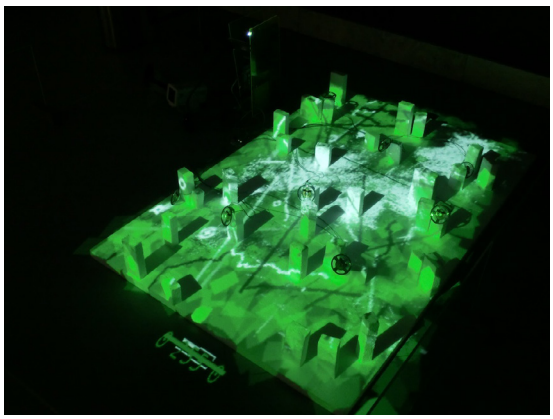


Figs. 21, 22
*Eer* screenshots.

**0 255 0** (2011)

The piece alludes to 100% green, in RGB color components. It is a video mapping installation on the model of a city where an abstract simulation, an endless game between three teams takes place. Human movement, detected with computer vision, casts team elements on the simulation that tint the game.



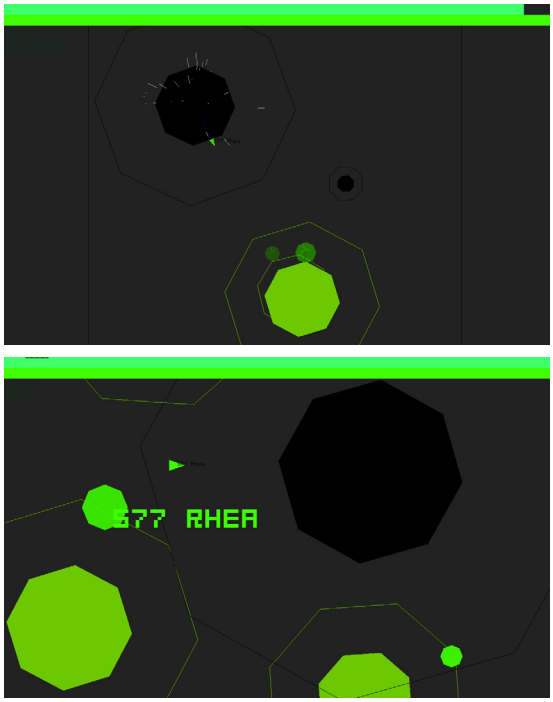


Figs. 23, 24
*0 255 0* at Algoritmos Criativos, Pavilhão Ciência Viva, Lisboa.

**577Rhea** (2013)

Stochastic exploration space game, with smooth gravity physics.

You are your planet's last hope. Your corrupted planet explodes. You have to time-travel through blackholes with primordial essences to prevent the inevitable collapse of your home.




Figs. 25, 26
*577Rhea* screenshots.

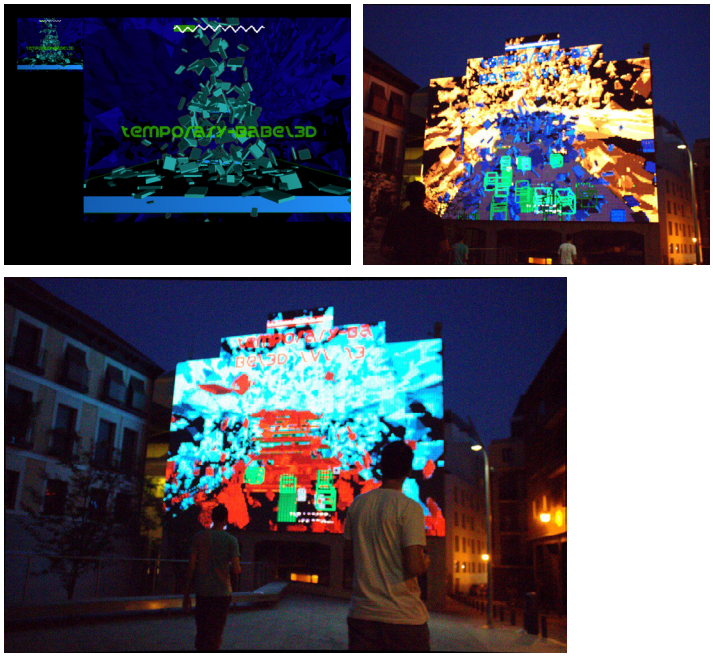
**Temporary-Babel2D** (2013)

An amusing and minimalist game, about libraries, time, temporary and permanent things. An interactive installation where you play in the mind-scape of the Babel Tower construction set, a space where time oscillates and perspective bends. You have 1h to reach the librarian at the top, guiding your avatars with joystick, mouse and microphone, through the several readers, hyperskates and book-shelves falling at the library, making the temporary architecture of Temporary-Babel2D.

Figs. 27, 28
*Temporary-Babel2D* at Festival Cidade Pre0cupada, 2013.

**Temporary-Babel3D** (2013)

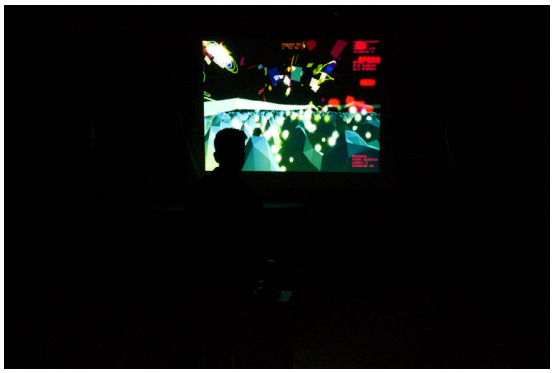
A networked computer tower-like construction game simulation is evolved from fluxes of movement by multiple real and virtual users. *Temporary-Babel3D* is an interactive game where you play in the mind-scape of the Tower of Babel construction set – a space where time oscillates and perspective bends; a space where real and virtual fluxes of movement by users carve building and destroying dynamics into the edification of an interactive community built game. This project synthesizes upon the archaeological movement of rebuilding the Tower of Babel, and how communities' movements shape transient and temporary virtual architectures within an engaging simple game environment.

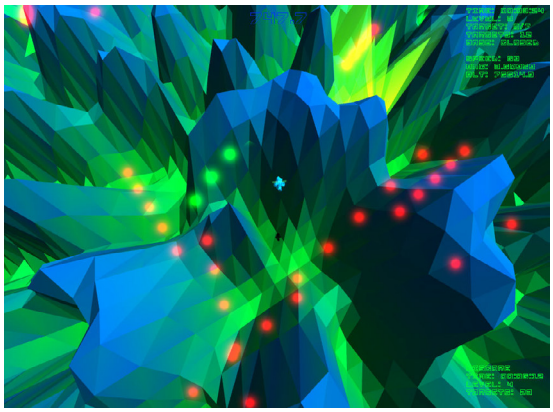



Figs. 29, 30, 31
*Temporary-Babel3D* at Solid Interfaces and Urban Games, Medialab Prado, Madrid, 2013.

**747.7** (2014)

Stochastic, immersive, meditative war game space. *747.7* is a game and an abstract flight simulator populated with drones and autonomous agents which must be taken down in order to proceed to the next level.

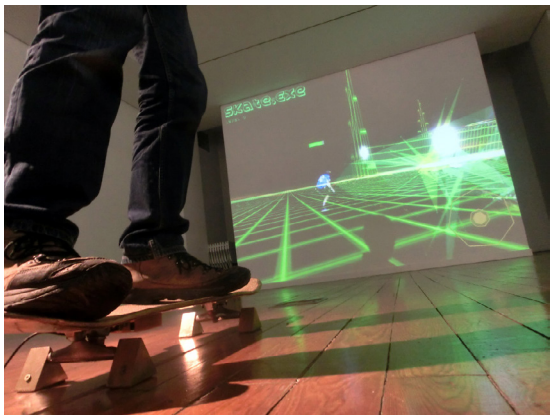


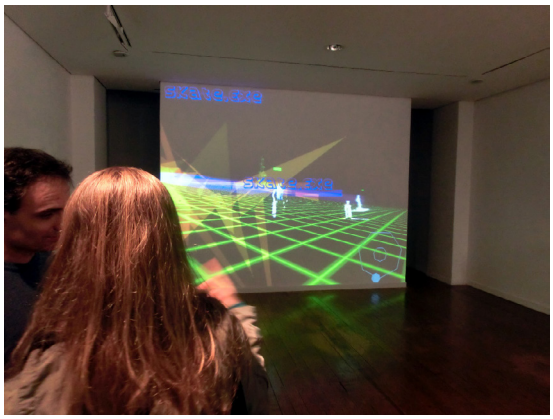


Figs. 32, 33
*747.7* at Levantamento das Pestes, Casa da Zorra, Évora, 2014.

**Skate.Exe** (2014)

A game-installation where you can skate your way through infinite virtual space and endless levels of progressing difficulty using a skateboard connected to the computer. You play the hero and have to capture the princess-witch while evading her attacks, which leads you to the next level. Your dexterity on the skateboard will be tested in the land of disproportionate forces!

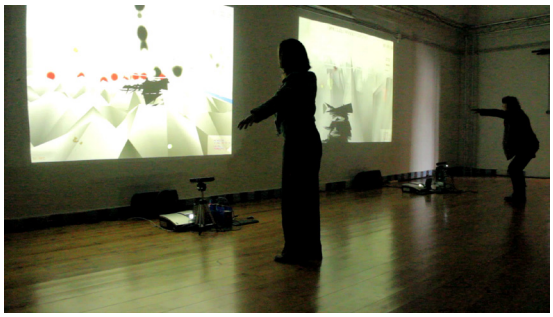


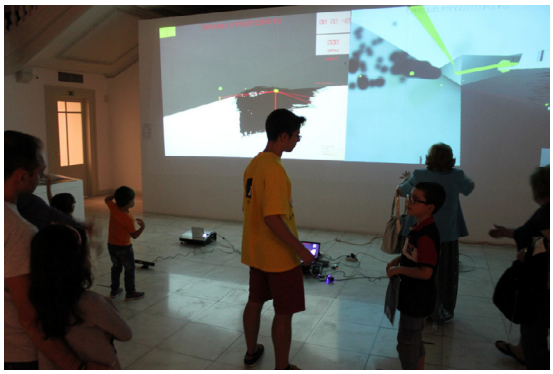


Figs. 34, 35
*Skate.Exe* at Galeria Luis Serpa Projectos, Lisboa, 2014-15.

**Draco.Wolfanddotcom.info** (2015)

Dragons returning to a 21st century overflowing with companies, dot-coms, humanoids, drones and dollars, about to experience the rage of these spiritual warriors. A local multiplayer audio-visual environment which abstractly stimulates its users to release their dragons, be transported and learn to fly in fantastic movement and destruction modes.

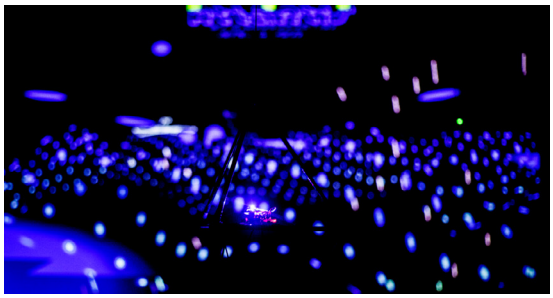


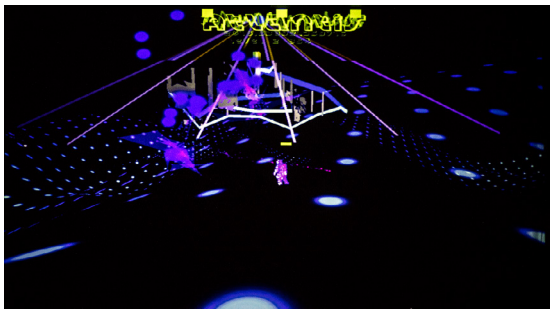


Figs. 36, 37
*Draco.Wolfanddotcom.info* at Espaço do Tempo, Montemor-o-Novo, and at Festival Aura, MU.SA, Sintra, 2015.

**Atlantis (Sólon Interface)** (2016)

An interactive suspended tetrahedron with electronics becomes the interface which allows users accompanied by Sólon's robotic voice to embark on a scholastic voyage of labyrinthine adventure in the quest of the lost city of Atlantis. By collecting oricalcum and taking it to the temple in the center of the tri-concentric city on the static seas, visitors appear to time travel backwards to what appears to be the original Atlantis.

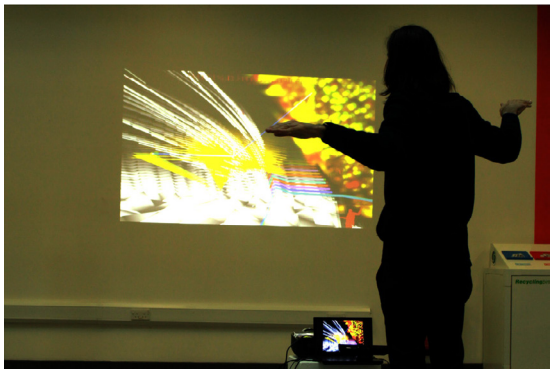


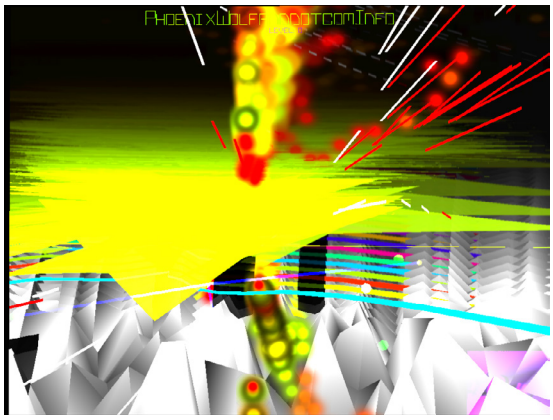


Figs. 38, 39
*Atlantis (Sólon Interface)* at Atlantis, Museu Nacional de Arte Contemporânea do Chiado (MNAC), Lisboa, 2016.

**Phoenix.Wolfanddotcom.info** (2017)

Immerse your body in an abstract phoenix embodiment art construct simulator. Fly, dive, crash, and set fire to a daunting perilous cathartic virtual path at the dawn of extinction. *Phoenix.Wolfanddotcom.info* is a videogame installation where users play and may become virtual mythological winged phoenixes, using full body invisible video interaction, within an environment over-populated with humans, obstacles, and scarce endangered organisms.

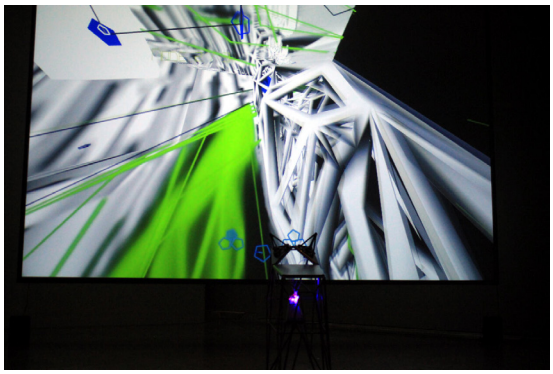




Figs. 40, 41
*Phoenix.Wolfanddotcom.info* at Balance Unbalance, Plymouth University, 2017.

**Wolfanddotcom** (2017)

*Wolfanddotcom* is a local networked ambient audio-visual videogame. Joystick-wolf-sculptures allow people to immerse as virtual wolves. The game is set in a post-human abstract environment synthesized from files and computer processes. Wolves are longing and racing to construct networks amongst themselves..



Figs. 42, 43
*Wolfanddotcom* at Sonae Media Art, MNAC, Lisboa, 2017.

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