

Be Sicklecell Be a Hero: Xenofantasies in Transparent Scenarios

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Abstract

This paper presents and discusses the poetics and concepts woven in the conception of the interactive media art and science installation *'Entrancer: Be Sicklecell Be a Hero'* (2018) inviting for a reflection concerning issues of race in science research mainly related to the sickle cell anemia. The work invites for the experience of a possible dance with a virtual moving model of a sickle-cell in AR (Augmented Reality) – mutated from the 3D model of a normal blood cell using morphogenetic algorithmic strategies. The experience is conducted by the rhythm of a Brazilian samba (live recording) distorted and combined with sonified fragments of sickle-cell image's textures under the microscope (imported as raw data to Adobe Audition). The samba metamorphoses into its distorted version resembles the mutant sickle-cell that changes shape due to a chemical alteration that can be a strategy against malaria – and not a genetic condition of black men and women. At the same time the installation is a tribute to emblematic works of Hélio Oiticica, bringing together in a conceptual combination or convergence the *'Parangolé'* and the stencil *'Be an Outlaw Be a Hero'* from the series *'Marginalia'*, proposing a piece that is a *'cross-over'* of both referred works, that has adaptive qualities concerning the most diverse exhibition conditions and spaces, and that is itself a mutant work in relation to the body and the environment.

Keywords

Augmented Reality, Race, Xenophobia, African American, Sickle Cell anemia, morphogenetic design strategies, parametric modeling, Grasshopper, Hélio Oiticica, Neoconcretism, Parangolé, Marginalia, non-object.

Introduction

“The expression *'non-object'* does not intend to describe a negative object nor any other thing that may be opposite to material objects. The non-object is not an anti-object but a special object through which a synthesis of sensorial and mental experiences is intended to take place. It is a *transparent* body in terms of phenomenological knowledge: while being entirely perceptible it leaves no trace. It is a pure appearance. All true works of art are in

fact non-objects, if this denomination is now adopted it is to enable an emphasis on the problems of current art from a new angle.” (Gullar, 1959 apud Asbury, 2005, p.170)

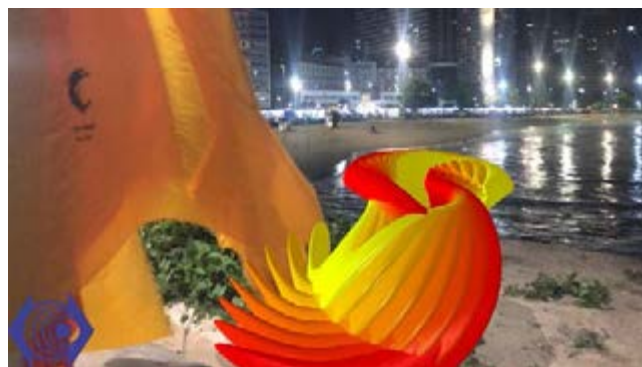


Figure 1: *'Entrancer: Be Sicklecell Be a Hero'* (2018), AR 3D model of mutant blood cell, experiments at the beach in Fortaleza, Brazil (photo by the author).

The argument that supports and feeds some of the *Entrancer's* art director Clarissa Ribeiro current aesthetic explorations in media arts and sciences and her poetics in a series she named *'cross-objects'*, including the installation *'Interstellar: Cross-Scale Space-Scapes'* (ISEA 2017, Manizales, Colombia; IEEE VIS 2017 Phoenix, Arizona, LIP Gallery UNIFOR - exhibition related to the Leonardo LASER talks Fortaleza, edition of March 2018 on Augmented Reality themed *'Superposed Worlds'*), are based on the intention of exploring the technology of Augmented Reality (AR) as the support for an actualization in the media arts and science of 2010s and the upcoming 2020s of the Brazilian Neoconcretism movement expression *'non-object'* coined by the poet and theorist Ferreira Gullar in the late 1950s. (Gullar, 1959 apud Asbury, 2005) Gullar was referring to special objects through which a synthesis of sensorial and mental experiences can take place – transparent bodies in phenomenological terms. Ferreira Gullar as member of the Brazilian art movement Neoconcretism is considered its main theorist, establishing the group's discourse framework in two central texts from 1959 - *'The Neoconcrete Manifesto'* and *'Theory of the Non-Object'*.

Michael Asbury's essay from 2005, offer a comparative study of the aesthetic philosophies of minimalism and

neoconcretism and, for the first time, presenting an English translation of Ferreira Gullar's 'Theory of the Non-Object', opens up the possibility of weaving my arguments with more accuracy in a paper written in English.

The work invites for the experience of a possible dance with a virtual moving model of a sickle-cell in AR (Augmented Reality) – mutated from the 3D model of a normal blood cell using morphogenetic algorithmic strategies. The experience is conducted by the rhythm of a Brazilian samba (live recording) distorted and combined with sonified fragments of sickle-cell image's textures under the microscope (imported as raw data to Adobe Audition). The final sound resembles a Maracatu – or maracatu of inverted beat (maracatu do baque virado), an Afro-Brazilian rhythm and performance genre practiced in the Northeast Region of Brazil. Back in 1990s 'Chico Science and Nação Zumbi' – a post-punk rock band – proposed appropriations of the rhythm in compositions performed with electric guitars and dramatic drums. One of the iconic performances of the band is a version of Jorge Mautner's 'Maracatu Atômico' (1974). Mautner, who was born in 1941, is a pioneer of the MPB scene and of the Tropicalia movement in Brazil.



Figure 2: *Afrociberdelia*, Chico Science & Nação Zumbi second album released in May 15th 1996 in Brazil.

The samba metamorphoses into its distorted version resembles the mutant sickle-cell that changes shape due to a chemical alteration that can be a strategy against malaria – and not a genetic condition of black men and women. At the same time the installation is a tribute to emblematic works of Hélio Oiticica, bringing together in a conceptual combination or convergence the 'Parangolé' and the stencil 'Be an Outlaw Be a Hero' from the series 'Marginalia', proposing a piece that is a 'cross-over' of both referred works, that has adaptive qualities concerning the most

diverse exhibition conditions and spaces, and that is itself a mutant work in relation to the body and the environment.

Considering ISEA 2018 main sub-themes, the work can be seen primarily as a contribution on the politics of science encompassing issues of xenophobia, colonial legacies and new powers intersecting with media art practices, addressing the challenges of diversity. At the same time, there is an interface with the sub-theme 'Spirit and Flesh', considering that the work brings issues related to intangible heritage concerning gene mutation and populations genetics integrated in aesthetic and poetic explorations viscerally attached to reality and lived experiences. The work invites to a plural and cross-scale understanding of the self and the body additionally contributing, as an Augmented Reality media art and science installation, to envisage the possibility of having artworks detached to fixed venues, helping in questioning the relevance of the classic museum environment and the potential for public space activations.

The Resplendent Body

"PARANGOLÉ = the body resplends as a renewable and sustainable source of pleasure; flexible concept of extreme adaptability to the most dissimilar places. Or should the PARANGOLÉ cape stands as the model of a low-tech aesthetics, representative sample of the realm of scarcity such as a fossilized shell or an abandoned cocoon hanging static in a museum, artefact of an archaeological site of a buried past? How will it compete in the fiber optics and internet high-ways surfing era? Classified as technologically incorrect?" (Salomão, 2003, p.27, translation by the author)

Hélio Oiticica's intention pulsating in the Parangolé series dialogues with Ferreira Gullar's Theory of Non-Object. The Parangolé affects behavior inviting for a dance with anarchy – it is embodyable, rescuer, emancipator – having at the same time an ethical and sociopolitical dimension. A Parangolé cannot be reduced to a 'mobile sculpture', it is an exercise of morphogenetic freedom – the invitation for an experience of immersion in a complex body of color, shape and movement that impacts the self that is expanded as the experience goes on, as if the consciousness could be poetically-topologically enlarged.

Gullar's "Theory of the Non-Object" was published in 1959, in a historical moment in which the 'Jornal do Brasil', one of the most important newspapers by the time, had the openness to publish in its weekend supplement the representative voices of Brazilian Neo-Concretism. Asbury (2005), examining the philosophical reflection on modernism that informs Ferreira Gullar's idea of a 'non-object', relates his discourse to interests in Gestalt psychology and phenomenology of perception, associating the tendency with the minimalism in North America. In his text, Gullar defends that, when painting fundamentally abandons representation as in the case of Kazimir Malevich, Piet Mondrian, and their art circles, there is the emergence of a metaphorical space and so it is "[...] the case of establishing the work of art within the space of reality, leading to this

space, through the apparition of the work – this special object – significance and transcendence.” (Gullar, 1959 apud Asbury, 2005, p.171) At some point Gullar mentions Moholy-Nagy and specifically his “[...] attempted to create sculptures that would inhabit space without a support.” (Gullar, 1959 apud Asbury, 2005, p.172) having, as pointed by the neo-concrete theorist, the intention of eliminating weight from sculpture, affecting, this way, a fundamental characteristic of an object.

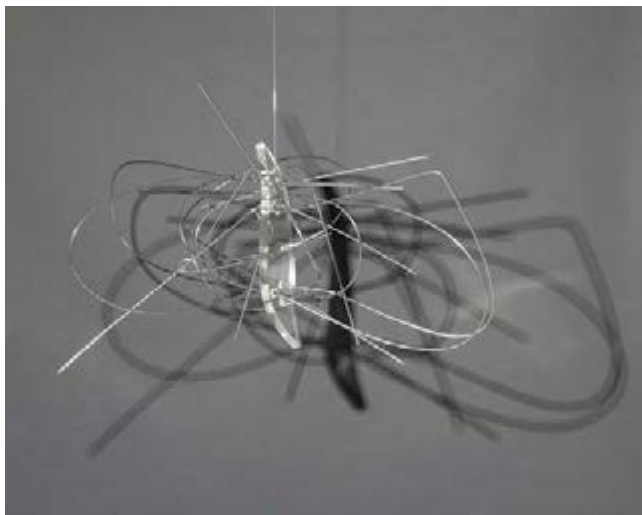


Figure 3. T Laszlo Moholy-Nagy, *Dual Form with Chromium Rods*, 1946, Plexiglas and chrome-plated brass, 92.7 x 121 x 55.9 cm (image source: *The Moholy-Nagy Foundation*)

According to Walter Gropius, close friend of Laszlo, his greatest effort as an artist was devoted to ‘the conquest of space’ in Gropius words, venturing into “[...] all realms of science and art to unriddle the phenomena of space and light” in the most diverse areas, incessantly attempting to “[...] interpret space in its relation to time, that is, motion in space.” (Gropius, 1959, p. viii). It is patent in Gullar’s arguments how the concrete art movement agenda and experimentation works as a *cellula mater* to the Brazilian Neo-concrete movement. Resulting, as pointed by Asbury (2005), from the difficulty encountered in categorizing a work by Lygia Clark, in his ‘Theory of the Non-Object’ Ferreira Gullar introduces issues that anticipated theoretical debates that would emerge in North America during the 1960s. According to Asbury, “While Robert Morris’s interest in Gestalt psychology would suggest a proximity with the theoretical repertoire of concrete art, Donald Judd’s text ‘Specific Objects’ and Ferreira Gullar’s ‘non-object’ present surprising similarities.” Asbury points Neoconcretism as one of the key references in what can be seen as a movement of legitimating Brazilian contemporary art that has currently gained international notoriety. Asbury believes that its notoriety is due to the fact that “[...] it has acquired a quasi-mythical status: that of signaling the national origin of contemporary Brazilian art.” (Asbury, 2005, p. 177) And it is in Hélio Oiticica and

Lygia Clark that the participatory work transcended the contemplative nature of precedent modernist art. Asbury (2005) adds that the gestation of the movement happens during the late 1940s and 1950s, at the crest of the wave of optimism that spread through Brazil by the time – a period during which “constructivist-orientated art, and concrete art in particular, was consolidated in Brazil.

Total source of Sensoriality

“Oiticica called his art environmental. Indeed, that is what it is. Nothing about it is isolated. There is no single artwork that can be appreciated in itself, like a Picture. The sensorial perceptual whole dominates. Within it, the artist has created a ‘hierarchy of orders’ – Relevos [Reliefs], Núcleos, Bólide (boxes), and capes, banners, tents (Parangolés) – ‘all directed toward the creation of an environmental world.’” (Pedrosa, 2016)



Figure 4. People on the streets of Mangueira neighborhood wearing the Parangolés: P 25 Parangolé Capa 2 ‘Xoxoba’ (1968), P 08 Capa 05 ‘Mangueira’ (1965), P 05 Capa 02 (1965), P 04 Capa 01 (1964), during the production of the movie HO, directed by Ivan Cardoso, 1979.

According to Mario Pedrosa in his seminal essay from 1966 ‘Environmental Art, Postmodern Art, Hélio Oiticica’, renowned for its early use of the term ‘postmodern’, it was during Oiticica’s initiation in samba that the artist “[...] moved from the purity of visual experience to an experiment in touch, in movement, in the sensual fruition of materials in which the entire body – previously reduced in the distant aristocracy of visuality – makes its entrance as a total source of sensoriality.” (Pedrosa, 2016) For Pedrosa, in Oiticica, “the Luciferian sin of aesthetic non-conformity and the individual sin of psychological non-conformity are fused. The mediator of this symbiosis of two Manichaeon nonconformisms was the Mangueira Samba school.” (Pedrosa, 2016)

Envisaging the possibility of having artworks detached to fixed venues, helping in questioning the relevance of the

classic museum environment and the potential for public space activations, we name the series “Entrancers”, proposing for ISEA 2018 in Durban different possible configurations of it, mainly contemplating actions and interventions in public spaces as part of the ISEA cultural journey. An Entrancer can be the one who uses an entrance or becomes an entrance itself or that becomes one with an entrance and, additionally, can be entrance by the experience itself, considering entrance (noun), meaning an act of entering or something that provides a way to enter something (pronouncing putting the accent on the first syllable), and entrance (verb) meaning to enchant, fascination, magic (If the accent is on the second syllable).

Back in 1996, Roy Ascott presented a lecture at the Total Museum Conference at the Art Institute of Chicago, titled ‘The Digital Museum’ suggesting the obsolescence of the museum, criticizing the museum’s curatorial limitations based on the participatory nature of art as experience and event, and particular notions of authorship and collaboration amplified as a possibility in the digital era. The Brazilian art historian Simone Osthoff was there and included her annotations and considerations about Ascott’s talk in an essay that integrates a Leonardo ISAST special project titled “A Radical Intervention: The Brazilian Contribution to the Electronic Art Movement” (1997), guest edited by Eduardo Kac. As highlighted by Osthoff (1997), “continuing championing a new architecture of connectivity, Ascott calls for spaces that enable the emergence of new realities. He envisions a museum that is adaptive to complex and increasingly immaterial systems.” (Osthoff, 1997)

In the essay Osthoff discusses the artistic legacy of Hélio Oiticica (1937-1980) and Lygia Clark (1920-1988) focusing on the interactive vocabularies and pointing to the practical and conceptual relevance of their developments for artists working with digital technology, emphasizing the syncretic character of their strategies that led to a fusion of two traditions – “a Western aesthetic canon that privileges vision and metaphysical knowledge, and Afro-Indigenous oral traditions in which knowledge and history are encoded in the body and ritual is profoundly concrete.”(Osthoff, 1997) The art historian remembers that Oiticica’s radical series Parangolés, initiated in 1964 in Rio de Janeiro, was revisited in the early 1990s by the X-Art Foundation in New York City recreating many colorful wearables that could be worn by participants both at the exhibition space of the Sandra Gering Gallery, and by the ones who accessed the virtual space of Blast’s MOO (Multi-User Object-Oriented Dimension, an online text-based form of virtual reality). As participants wore the virtual Parangolés in the MOO, the computer screen was projected on the gallery wall, displaying the interaction between gallery visitors and remote participants. Osthoff argues that the X-Art Foundation initiative unveil affinities and influences of Oiticica’s participatory paradigms to the telematic arts of the 1990s. In Osthoff’s understanding, Roy Acott’s view presented at the Total Museum Conference at the Art Institute of Chicago contrasts radically with some curatori-

al postures that presents Oiticica’s works, specifically the Parangolé series, as in his retrospective in 1993 at the Walker Arts Center, that relegates its participatory aspect to past events and “[...] viewers, paradoxically, were distanced further from the experience of the Parangolés by being encouraged to locate these uncanny creations in the past expressions of a distant culture’s exotic dance.” (Osthoff, 1997) And this is exactly the connection we meant to highlight and expand here as a contribution to ISEA 2018 conversations – the one that viscerally links a Brazilian and African live cultural heritages. A connection that makes it explicit the beauty of shared cultural values that have the sensorial at the forefront, which enlarges space, consciousness and the body, in a complex and cross-scale sense. Cultural heritages in which bodies are perceived not as isolated entities, like armors or shells to the fragile spirit, but as moving light in space, as the spirit itself – free and open to recombination, mixture, permeable to sound and color, and to the darkness as well.

Morphogenetic Heritages

Reductionist points of view can be helpful sometimes when one needs to make a choice in fractions of a second. Nevertheless, most of the time, they hide important subtleties and complexities and can feed prejudice, discrimination and segregation, having the power of not only psychologically damage the ones who are ‘classified’ as belonging to an unprivileged or abnormal dualistic category as health and sick, black and white, boy and girl, it can cost people’s lives. Recent researches in Psychology (Mays, Cochran and Barnes, 2007), using newly emerging methodologies in both measurement of contextual factors and functional neuroscience show how race, racial prejudice, and race discrimination shape human experience and have harmful effects on health.

With almost 60 million citizens with African origins, Brazil ranks first among the countries with highest black population outside Africa. The second in the rank is the United States. Both countries have a long history of racial discrimination and, as one of the direct consequences, long-run trends in racial differences in health in the founding distribution in science research. Sara Reardon introduces a brief article discussing the initiative of the US agency NIH to assess whether grant reviewers are biased against minority applicants, with the following reflection – “Richard Nakamura, director of the Center for Scientific Review at the US National Institutes of Health (NIH), does not consider himself to be racially biased. Yet a test of his speed at associating certain words with faces of different races revealed a slight unconscious prejudice against minorities. If the director of the institute that oversees the NIH’s grant process harbours these inclinations, he wonders, are grant reviewers affected as well?” (Reardon, 2014) The analyses launched by NIH agency in 2014 intend to determine whether bias hampers minority scientists who seek agency funding. A 2011 study in Science (Ginther, 2011) found that white researchers

receive NIH grants at nearly twice the rate that African American researchers do even when factors such as publication record and training are equivalent. In statistical analysis such as the one presented by Leah Boustan and Robert Margo (2016) shows that despite racial disparities in health have narrowed substantially over the course of the twentieth century in the US, there still remain medically and economically significant gaps in health outcomes by race. The panorama is not different in Brazil. In a book where he offers an overview and a comparative analysis on 'Race and Multiraciality in Brazil and the United States' (Daniel, 2006) G. Reginald Daniel, Associate Professor of Sociology at the University of California, Santa Barbara, presents search results indicating that, in Brazil, the more phenotypically African the individual, the lower he or she was in the social order in terms of education, occupation, and income despite the lack of legal barriers to equality. According to the researcher,

“Notwithstanding the contradiction between the reality of race relations and the ideology of racial democracy, these findings, along with research conducted in the early 1970s by U.S. scholars indicated that Brazil exhibits fluid racial markers. However, during the two decades of military rule (1964–85) Brazilian scholars were largely prohibited from discussing the problem of racial inequality by a government invested in claiming that no such problem existed.” (Daniel, 2006)

It is important to say that the fact racial inequality issues in Brazil were prohibited from being discussed, ignored and hidden by the government during the military regime in Brazil emphasize the responsibility in promoting empowerment of marginalized communities and their cultural heritage, unveiling issues explored by Hélio Oiticica with both the Parangolés and the series 'Marginalia' with the stencil 'Be an outlaw Be a Hero'.



Figure 5: Hélio Oiticica Stencil Seja Marginal Seja Herói (Be an Outlaw Be a Hero), 1968, Black ink on cloth, 37 3/8 x 45 1/4 in. (95 x 115 cm), Signed by César Oiticica Filho on the reverse. (Phillips, 2017)

The intention in proposing the present reflection encapsulated in the conception of a media art and science installation is to contribute to the debate around these issues and to help spreading the knowledge about the need to approach such problems openly in the most diverse forums.

Generative Alterations

Sickle cell disease (SCD) is the most widespread hereditary blood disorder in the United States. It affects about 72,000 individuals and is at the same time the most common inherited disease among African Americans. According to the Brazilian government agency FAPES, sickle cell anemia is the most prevalent hereditary disease in Brazil, and it is estimated that there are more than 50,000 cases (Toledo, 2017).

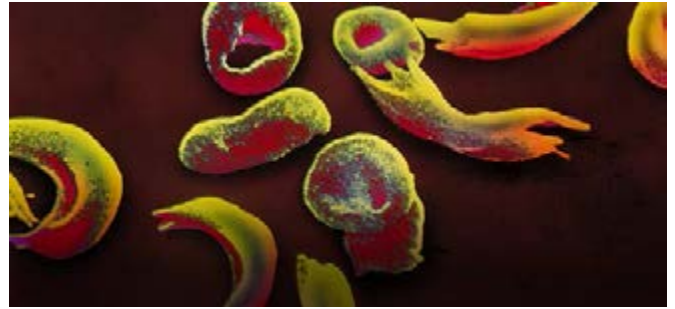


Figure 6: The shape of the disease: the red blood cells are shaped like sickles, which means that they cannot transport as much oxygen (Bayer, 2015) (copyright: Omikron Science/Gettyimages, Josh Edelson).

Despite it affects primarily the African Americans in both cases, Brazil and USA, people of other races are also affected by SCD – “[...] a significant prevalence of the mutation responsible for sickle cell has been reported among other ethnic groups such as those native to Italy, Greece, Turkey, Saudi Arabia, India, Pakistan, Bangladesh, China, and Cyprus.” (Ndefo et al, 2008) The sickle cell gene is caused by a single amino acid mutation in the beta chain of the hemoglobin gene,

“[...] characterized by a structural abnormality in the beta-globin chain of the hemoglobin molecule within the red blood cells (RBCs). The sickle mutation is a single base change (GAT → GTT) in the sixth codon of exon-1 of the beta-globin gene on chromosome 11. This change leads to the synthesis of the beta-globin polypeptide of the hemoglobin molecule. This mutation causes the replacement of the normal glutamic acid with valine acid, thus resulting in the formation of the sickle cell hemoglobin (HbS). This hydrophobic aminoacid substitution causes the hemoglobin to take on a “sickle” shape when in a deoxygenated state.” (Ndefo et al, 2008)

As confirmed by Michael Aidoo and his collaborators (Aidoo et al, 2002), in a paper where the protective effects of the sickle cell gene against Malaria is discussed, inheritance of the mutated gene from both parents leads to sickle cell disease. On the contrary, the individuals that have some protective advantage against Malaria, who are carriers for the sickle cell disease, have one sickle gene and one

normal hemoglobin gene from their parents. This condition (not a disease) is identified as 'sickle cell trait'. As pointed by the team of researchers (Aidoo et al, 2002), as a result, the frequencies of sickle cell carriers are high in malaria-endemic areas. In a paper recently published in *NATURE Heredity*, research partners from the Institute of Evolutionary Biology, School of Biological Sciences, University of Edinburgh, described the astonishing changes and progress that have occurred in the field of population genetics over the past five decades, concentrating on the earlier history of the field. The researches mention seminal works including the one by Allison A. C. (Allison, 1964), relating cells polymorphism and natural selection in human populations,

"Ecological geneticists had demonstrated the action of selection on conspicuous polymorphisms such as the shell colour and banding variants of *Cepaea nemoralis* (Ford, 1975), and the sickle cell human haemoglobin variant had been shown to be maintained by heterozygote advantage caused by resistance to malaria (Allison, 1964). These studies showed that natural selection could be a powerful force influencing variation within species." (Charlesworth and Charlesworth, 2017)

The convergence proposed here, includes an appropriation of the notion of morphogenesis in the artist poetics promoting a complex interrelation that historically connects studies of population genetics in Evolutionary Biology running computation simulations on heredity (Dawkins, 1987), with contemporary strategies for the generation of form making with the use of algorithms in Architecture, Visual Arts and Product and Graphic Design, that had evolved drastically along the last 20 years and that are part of my research interests and production since the late 1990s.

Be Sickcell Be a Hero

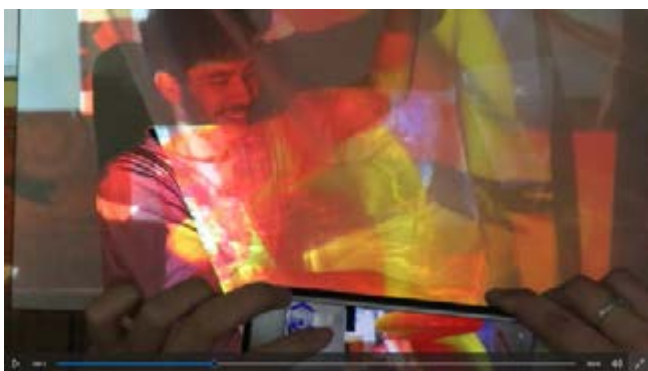


Figure 7: 'Entrancer: Be Sickcell Be a Hero' (2018), exhibition at the LIP Gallery related to the LASER talks Fortaleza edition of March 2018 on AR, hosted by Clarissa Ribeiro (video frame and photo by the author).



Figure 8: 'Entrancer: Be Sickcell Be a Hero' (2018), AR 3D model of mutant blood cell, experiments at the beach in Fortaleza, Brazil (photo by the author).

The installation 'Entrancer: Be Sickcell Be a Hero' (2018) can be seen as a gene for several possible installations, adaptive to the most diverse contexts and venues. The intention in proposing, discussing and presenting at ISEA 2018 is to offer the participants the experience as a key or entrance to gain awareness about the relativistic nature of self, its mutant existence and expression, emergence from cross-scale relations and conversations that can take place in several places at once. When you are invited to a dance with human's micro scale universe characters – mutated bloody cells, you are receiving not only the invitation to deconstruct an issue of race that directs resources in science research around the world, but an invitation to deconstruct a limiting and mutilated understanding about nature itself.



Figure 9: 'Entrancer: Be Sicklecell Be a Hero' (2018), AR tracker – stencil in a t-shirt, experiments for ISEA 2018 cultural journey (photo by the author).



Figure 10: 'Entrancer: Be Sicklecell Be a Hero' (2018), AR tracker

The intention in 'Entrancer' (2018) is not to recreate the Parangolés but to propose an appropriation of Oiticica's strategies to openly discuss, in a sensorial conversation and critical reflection that involves the entire body, around

pressing issues of race related to the administration of financial resources in science research. Every year, in Brazil, sickle cell anemia kills more people (mainly African Americans) than HIV. 'Entrancer: Be Sicklecell Be a Hero' (2018) invites for a corporeal conversation with a virtual entity and recalls practices where a corporeal conversation with spiritual beings is a ritual of empowerment that can offer a cure, healing, if one offers the self.

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Author Biography

Clarissa Ribeiro, media artist and researcher, chair of the LASER talks Fortaleza, PhD, MArch, B.Arch, Former Fulbright Scholar, Director of the Lab for Innovation and Prototyping (LIP), coordinates the CrossLab research group at the University of Fortaleza in Brazil. As an independent artist, she has been producing and exhibiting experimental interactive installations exploring cross-scale perspectives in media arts and science, working in collaboration with other artists, research groups and art collectives in her home country, Brazil, and abroad. www.clarissaribeiro.com

Stavros Didakis (PhD) is a researcher, and academic, creating interactions, systems and installations, challenging preconceptions and speculations on possible technological futures with practices that merge various disciplines, such as computational media, Internet of Things, interface design, as well as sonic, visual, and interactive art. At present Stavros is an Associate Professor and programme leader in Digital Media Design at the University of Plymouth (UK), and a Visiting Lecturer in Peking University. Stavros has won grants and awards in creative technologies, he has exhibited his interactive works in international exhibitions and biennale, and he has also made numerous publications in conferences, journals, and books. <http://soniconlab.com>

Herbert Rocha, Industrial Designer, MSc, works at LAPIN UNIFOR developing innovative products and strategies. He has been collaborating with Clarissa Ribeiro for over a year in projects involving Augmented Reality and 3D modeling and animation.

Daniel Valente, PhD, works at LAPIN UNIFOR developing innovative products and strategies. He was awarded prizes as the Sony Ericsson Content Awards in 2009, best article in the 11th Brazilian Symposium on Computer Games and Digital Entertainment (SBGames 2012, 2nd place). He has been collaborating with Clarissa Ribeiro for over a year in projects involving Augmented Reality and online application design.

Candice Ribeiro, Dentist, specialist in Dental Public Health (DPH) and Orthodontics. She has been collaborating with Clarissa Ribeiro in projects exploring public health related issues.