ARTICLE

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Stereoscopic vision in Wilfrid Sellars’ thought: ontological approaches through post-contemporary art

Miguel Ángel Rego Robles
Universidad Europea de Madrid and Escuela Universitaria de Artes TAI

Date of submission: January 2023
Accepted in: July 2023
Published in: July 2023

Recommended citation

Abstract
By analyzing Wilfrid Sellars’s contributions to dealing with the complexity of what knowledge is and how it is formed – epistemology and ontology – and Thomas Metzinger’s theoretical complement to Sellars’ ontology, I explore how the impasse in contemporary art caused by the aesthetic correlation of subject and object can be overcome by a new paradigm in post-contemporary art.

Firstly, I use Sellars’ account of stereoscopic vision and his critique to foundationalist ideas and classic empiricist theories to describe how 20th-century modern and post-modern art practices can be transcended through rejection of the given contemporary realism and naturalist-materialism. This notion has gained particular relevance due to breakthroughs within the fields of neurosciences and computer sciences, as demonstrated in such examples of post-contemporary art as Emanuel Gollob’s Doing Nothing with AI 1.0 (2019).

I then expand on the Sellarsian scientific ontological perspective through Thomas Metzinger’s notion of the Phenomenal Self Model (PSM), which provides an approach not found in Sellars’ thought. A return to Sellars is necessary, however, to attend to other forms of post-contemporary art, including Serious Games III: Immersion (2009) by Harun Farocki, which focuses on the formation of human experience through a scientific ontological understanding of the mental as part of nature.

The theories of Wilfrid Sellars and Thomas Metzinger enable us to go beyond the drift initiated by Marcel Duchamp at the beginning of the 20th century, by configuring a paradigm for post-contemporary aesthetics that clarifies the current state of the arts and non-correlationist thought.
Keywords
Wilfrid Sellars; Thomas Metzinger; post-contemporary art; stereoscopic vision; cognitive sciences; neurosciences

Visión estereoscópica en el pensamiento de Wilfrid Sellars: enfoques ontológicos a través del arte poscontemporáneo

Resumen
Al analizar las contribuciones de Wilfrid Sellars para tratar la complejidad de lo que es el conocimiento y cómo se forma, epistemología y ontología, y el complemento teórico de Thomas Metzinger en la ontología de Sellars, exploro cómo la estancación en el arte contemporáneo causada por la correlación estética del sujeto y el objeto puede superarse con un paradigma nuevo en el arte poscontemporáneo.

En primer lugar, utilizo la visión estereoscópica de Sellars y su crítica a las ideas fundacionalistas y a las teorías empíricas clásicas para describir cómo las prácticas artísticas modernas y posmodernas del siglo XX pueden trascenderse mediante el rechazo del realismo contemporáneo dado y el materialismo naturalista. Esta noción ha ganado especial relevancia debido a los avances en los campos de las neurociencias y las ciencias informáticas, como se demuestra en ejemplos de arte poscontemporáneo como el de Emanuel Gollob Doing Nothing with AI 1.0 (2019).

A continuación, explico la perspectiva científica y ontológica de Sellars a través de la noción del automodelo fenomenológico (PSM por sus siglas en inglés, Phenomenological Self-Model) de Thomas Metzinger, que proporciona un enfoque que no se encuentra en el pensamiento de Sellars. Sin embargo, es necesario volver a Sellars para asistir a otras formas de arte poscontemporáneo, incluyendo Serious Games III: Immersion (2009) de Harun Farocki, que se centra en la formación de la experiencia humana a través de una comprensión científica ontológica de lo mental como parte de la naturaleza.

Las teorías de Wilfrid Sellars y Thomas Metzinger nos permiten ir más allá de la deriva iniciada por Marcel Duchamp a principios del siglo XX, configurando un paradigma para la estética poscontemporánea que aclara el estado actual de las artes y el pensamiento no correlacionalista.

Palabras clave
Wilfrid Sellars; Thomas Metzinger; arte poscontemporáneo; visión estereoscópica; ciencias cognitivas; neurociencias

Introduction

"if consciousness is the originary condition of objectivation, of which science is one instance, it follows that science cannot investigate consciousness" (Brassier 2011, 10).

All modern philosophical approaches that adopt a correlationist perspective, such as Hannah Arendt's account of what is given to human beings and what is made by them (1998, 110-111), identify the world and human existence as mutually dependent. This has been attributed to the legacy of Immanuel Kant's transcendental idealism, which goes beyond human sensorial convictions in knowledge formation to focus on a prioriistic mental ways of processing evidence. Kant's theoretical premises established the correlation between being and thought when accessing the real, as initiated by René Descartes' rationalism in 1637.

Art has been following a similar pathway since the 1910s through its indeterminacy: art “leaves space” for the viewer, the viewer ‘completes’ the work” (Malik 2015, 185). This classical utopian procedure of developing art based on the completion of the aesthetic experience through the act of thinking has its idealist origins in Marcel Duchamp's work: “All in all, the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act” (1973, 140). Philosophical attempts to overcome this correlationist inertia have increasingly been made at the beginning of the 21st century (Cox, Jaskey & Malik 2015, 15-31).

In order to present a new understanding that surpasses such dualism, these developments have taken into account previous philosophical attempts to break away from modernism.
1.1 Challenging the “Myth of the Given” and classic empiricism

Kant’s transcendental idealism established the object/subject interdependency within modern dichotomies. However, other thinkers have rejected the innate ideas of Descartes to follow the path of empiricism, including John Locke, and David Hume, who stated the premise that human internal and external perception creates knowledge through experience (1845). The American philosopher Wilfrid Sellars rejected these classic empiricist postulates when developing his theory in the field of critical realism and emphasized that a mind-independent world does exist and is evidenced through the philosophy of perception (1968). One of Sellars’ main contributions to philosophy and science was to challenge Descartes’ body/mind dichotomy, a propositional structure based on modern foundationalism.

Classical foundationalists have maintained that basic essentialist beliefs or foundational bases that serve to develop complex beliefs exist. This resolves the regressive epistemic problem known as dialeus, in which a statement or proposition that has not been validated can be endlessly questioned. As a modern foundationalist, René Descartes attempted to find indubitable truths by implementing his own practical methodology: questioning all his beliefs. The most influential result of this methodology was his “cogito, ergo sum” principle, which led to the subject being established as the core of history and Western rationalism (2006).

Wilfrid Sellars belonged to a philosophic branch within modern epistemology called cohererism, known for its criticism of foundationalist theories. His approach rests on the idea that not all justified beliefs follow a path that results in foundational knowledge. While in internalist philosophy a belief is justified through foundational knowledge, externalism takes non-internal factors into consideration (1956). A Sellarsian middle path recognizes that the mental is part of nature, in a non-master-slave position. This naturalistic point of view asserts that there are non-internal factors such as empiricism or reason within nature. For example, the world matter made by data or, among other scientific fields, mathematics (1962). To demonstrate how this normative account matches with a causal one, Sellars relied on the correct usage of a word in relation to other linguistic entities to describe a matter or non-matter experience. It is the encounter between human experience and the conceptualization embedded within a global linguistic system that has helped us to understand the shift from a pre-linguistic to a linguistic state (1956).

To clarify the previous paragraph, the concept of the given, also followed by classical empiricists who shared a metaphysical understanding of ourselves in terms of perception, has supported the idea that sensory experience, such as when one eats a strawberry, is “itself a kind of reliable given” and “since we have direct access to our senses, they must provide a foundation for our knowledge” (Johnson 2015). Other thinkers, such as Sellars, have claimed the sweetness of the strawberry does not solely originate from one’s sensory experience, but rather a complex interrelation of various factors that form the phenomenon in terms of knowledge. Ontologically, the sweetness may be an intrinsic property of the strawberry’s matter and/or a kind of taste generated through the encounter of the human and this matter. At the same time, the “sweetness state” condition is not enough in itself to explain knowledge formation. Alternatively, a conceptualization of sweetness is made in relation to the aforementioned meta-linguistic rules based on discrimination, differentiation, and comparison between other conceptual tokens. The correct usage of the word sweetness is then analyzed through its empirical application within this contingent manifestation; it therefore escapes the control of the Cartesian and classical empiricist given. By discarding such abrupt frontiers, Wilfrid Sellars addressed the complexity of knowledge production. Neither perceptual experience (in the sense of classic empiricism) nor linguistic conceptualization (in the sense of rationalist thought) alone can epistemologically explain this unknown paradigm (1956). I will therefore use this dissolution of the given to address the principles of a number of post-contemporary artworks.

At this point, it is necessary to describe the interrelation between what Sellars identified as the manifest image and the scientific image, and their interrelation into a stereoscopic vision. According to Sellars, this enables us to move beyond the confrontation made by epistemological approaches based on modern dualisms and, through its separation from epistemology, enables a new ontological comprehension (1962).

1.2. Manifest image and scientific image

According to Sellars, to reconcile what we obtain from our perceptual mechanisms and the theoretical scientific understanding of that experience, the two images must be articulated into a stereoscopic view (1962, 55). In his analysis of Sellars’ ideas, Ray Brassier refers to this way of picturing the world in terms of parity: manifest and scientific “images are not in fact competing over the same territory” (2011, 8). While the manifest image is an irreflexive account of what we receive from the real world through our phenomenal states, the scientific image makes sense of the manifest image through a corroborated approach based on current knowledge. In other words, the manifest image allows us to construct a causal sense of the world through our limited biological features as human beings and, eventually, the scientific image corroborates what we obtain from the world, enabling us to provide reasons founded in theory and science for every aspect of the manifest image. Paradoxically, to a certain extent, this balanced approach prioritizes the scientific image. It is therefore necessary to emphasize that both parity and priority operate at different levels: “that of conceptual interpretation and that of ontological description and explanation” (Brassier 2011, 8). As Sellars explained, “in the dimension of describing and explaining the world, science is the measure of all things (Scienitia Mensura)” (1956, 303). Yet, it is imperative to avoid determinism:

“The interpretation of the framework of sense impressions as a theoretical framework suggests that the analogy between the attributes, of impressions and the perceptible attributes of physical objects is but another case of the role of analogy in theoretical concept formation. Analogical concepts in science are methodologically dependent on a conceptual base to which they are not reducible” (Sellars 1968, 21).
Sellers’ critique of the given allows for an ontological scientific explanation of human perception, behavior and, in definitive terms, knowledge based on the imperceptible physical systems we possess and phenomenological states. His perspective provides a tangible critique of correlationalist ideas, wherein object and subject are irreducibly interdependent, and, more precisely, of the obstructions caused by enlightenment rationalism and its contemporary usage.

The theorist Suhail Malik has addressed the correlationalist approach within the field of art, in which he claims the Duchampian legacy has made artwork dependent “upon its receiving subject, the addressee of the work, who is taken to constitute it” (2015, 185). Taking manifest forms of production within speculative realism (SR) into account, Malik has attempted to clarify what post-contemporary forms of art are possible (Meillasoux 2010; Harman 2018; Brassier 2007; Hamilton Grant 2008). As Malik noted, due to the privileging of objects over audience response, the Documenta 13 event revealed the conservative and trivial aspects of SR. The pseudo-primacy of objects revealed a negation that only affirmed human significance and, accordingly, the aesthetic experience (Malik 2015, 188). Therefore, possible non-correlationalist notions of post-contemporary aesthetics may be found in parity relations forged by the Sellarsian stereoscopic vision and challenging the given. In this sense, digital generative production by refined and sophisticated AIs – despite the creative role played by the human hand, at least in the current preliminary state – deploys a parity interrelation between the manifest and scientific image. Post-contemporary art should be based on the primacy of detaching human thought from the object, as when generative strategies overcome primary stimulus based on data and information uploaded on the internet, but also consider the human mind as part of nature in a non-master-slave position. New developments in AI can configure aesthetic experiences and proposals based on digital network sources and neuroscientific data, thus removing human intentionality. New forms of aesthetics would appear in the relationship between the audience and post-contemporary art based on challenging indeterminacy, interrelating experiences originating from the object to the subject, and shifting from the primacy of artist intentionality – dominant since the beginning of the 20th century – to algorithms and digital strategies configuring non-human-determined formations. A post-contemporary agenda within the art field would need to address the modern interrelation between object thought/made and interpreting subject in order to go beyond the indeterminacy of contemporary art (Malik 2015, 191).

An illustrative example of this is Doing Nothing with AI 1.0 (2019) by Emanuel Gollob (Figure 1), which follows Malik’s thesis by transitioning from correlationism, in which “reality itself cannot be known ‘in itself’ since it is always thought or apprehended by a consciousness”, to the “possibility of a knowledge of the real for what is independent of thought” (Malik 2015, 186).

This neuro-reactive installation uses the brain impulses of an audience to create a sculptural choreography from four million possible movements. Rather than what we know or what we configure through the act of thinking, the act of interpreting this neural data – scientific ontology – originates from the artwork. Displayed at the Cuando las mariposas del alma baten sus alas exhibition, curated by Karin Ohlenschläger at LABoral in Gijón, Gollob’s artwork depends on an AI developed with a generative machine learning model. Doing Nothing with AI 1.0 features matter tracing the perceptual experience through its formal configuration – thus the manifest image – and through contemporary philosophical trends within neurosciences based on addressing the complexity of thought – the scientific image – without disregarding the social sciences and humanities as a fundamental part of this understanding (Figure 2).
Ontologically, like the sweetness of the strawberry, the aesthetic experience of this artwork is an inner property of the neuro-reactive sculptural matter and/or a kind of phenomenon generated through the encounter between the human and this matter. Thus, a post-contemporary art agenda is rendered in which the Cartesian and classical empiricist given is surmounted through the naturalization of the mental. Paradoxically, Sellars’ approach provides the opportunity to reflect on how human thoughts or sensations can be analyzed as other entities belonging to nature and thus theorized to understand the complexity of human behavior. By dealing with neuroscientific approximations that might easily be viewed merely in terms of profit, we also open more responsible ways to perceive these states and approach the indecipherable complexity of the human being, as in the quantified analysis of mental activity provided by Gollob’s artwork. This is why an anticipatory ethical agenda is extremely important.

The ontological description initiated by Sellars, in which subjective rationality and objective scientific selfhood are interrelated, is being addressed across various domains, including applied phenomenology, which explores the neuronal system through contemporary cognitive sciences, neurobiology, and the neurosciences. Thomas Metzinger has emerged as one of the main contributors to this analytical approach.

2. A scientific and empiricist ontological application: Metzinger’s confrontation with the “Myth of the Given”

“We will never solve the philosophical puzzle of consciousness” (Metzinger 2010, 1).

Thomas Metzinger has applied his theoretical investigations in the neurobiological field, creating theoretical/factual solvency. Addressing the ontological scientific level, which is unresolved in Sellars’ philosophy, Metzinger claims that new types of representation and tools within the field of contemporary technologies, such as virtual reality (VR) goggles, can enable us to understand sub-personal mechanisms in the human condition (2003). His investigations can be conceived as ontological propositions through phenomenology that have the potential to complete Sellars’ ontological perspective (2010).

2.1. Thomas Metzinger’s ontological application

Due to advances in technology, scientific breakthroughs are endlessly revised until, in most cases, they are disproved. It is important not to forget that, ontologically, the scientific image is affected precisely by its evolution in terms of knowledge:

“The connection of these epistemic notions with our current conceptual structure (which is necessarily the point of view from which we view the universe) is loosened in a way which makes meaningful the statement that our current conceptual structure is both more adequate than its predecessors and less adequate than certain of its potential successors” (Sellars 1968, 138).

Attempting to explain the phenomenon of selfhood, Thomas Metzinger has proposed a naturalist-materialist approach to the ontological position opened up by Sellars. Before analyzing this proposition, it is necessary to explain that Metzinger has created a distinction and a problem in reference to the subject. On the one hand, Metzinger’s notion of phenomenal selfhood has surpassed the modern understanding of the self by accentuating the predominant role of the scientific selfhood domain, whilst Sellars, following Kant’s proposition, emphasized the existence of a rational self-consciousness based on the interrelation between subjective rationality and objective scientific/selfhood. Metzinger’s analysis, therefore, needs to be completed and revised with the critical realism perspective of Sellars and other thinkers who take social subjective rationality and scientific selfhood into account without prioritizing either. This position relates to contemporary realist drifts such as new realism (Gabriel 2013; Ferraris 2014) and the aforementioned speculative realism.

It is necessary to consider the relationship between the human being as a process and what is generated by that being as represented content: or, in other words, between the representing process and the content of the representation — which is generated by that representing process. This analysis involves questioning the self, as Sellars has enacted through his critique of the given. Metzinger has attempted to resolve what is missing in Sellars’ ontological applications through an understanding of the self-model. The “rubber hand illusion”, a phenomenal experiment in which a participant feels that a plastic hand is their own, suggests that conscious experience — the content of the representing process — can be entirely activated through neural correlates in the premotor prefrontal cortex (TEDxRheinMain 2011; Metzinger 2010, 3). The representational state is composed of both the representing system — whether the “vehicle” that is activated, or the human being as a process — and the represented content: the conscious experience emanating from the “vehicle”. Metzinger has used the rubber hand experiment to introduce his notion of the phenomenal self-model (PSM) as the way we experience our consciousness: “We do not see the window but only the bird flying by. We do not see neurons firing away in our brain but only what they represent for us” (Metzinger 2010, 7). Therefore, he has made the radical phenomenologist claim that the self has always been a construction and never existed in the way it has been understood within the Cartesian tradition. Instead, we have a PSM exposed to manipulation due to the continuing unveiling and understanding of our representational states. Gollob’s artwork addresses this unveiled representing system through new breakthroughs in neuroscience, AI, and generative machine learning. Continuing with the Sellarsian notion of the scientific image, we can consider human existence as a new thinkable ontological entity, in which both representing system and represented content are copresent.
As Metzinger has demonstrated through phenomenal experiments, the representing system is not limited to the form of the human organism and can be expanded by, for instance, the phenomenology of direct realism, creating non-constrained forms of represented content in connection with a real world beyond our bodily alienation, a premise revealed by Andy Clark and David J. Chalmers through the notion of “extended mind” (1998). If we only take human biology into account in the construction of consciousness, the experiences constrained by such biological limitations can only be considered a small fraction of the real world and, therefore, a small fraction of what we can experience through phenomenal processes. “Modern neuroscience has demonstrated that the content of our conscious experience is not only an internal construct but also an extremely selective way of representing information” (Metzinger 2010, 6). Metzinger has been criticized not only for a reification of the self through phenomenology, but failing to consider a rational-subjectivity as proposed by Sellars. Phenomenal selfhood and rational subjectivity have different levels, in a parity way, but are intertwined: we are both biological states and containers of experiences.

Another illustrative example is the sense of phenomenologically possessing entities through VR, a complex activation in the central nervous system that directly effects and models our behavior and enables us to view a human being as an abstraction exposed to forms of agency. The PSM is considered to be a phenomenal notion that serves as an interface between this new ontological understanding of the human being and the world (2003).

Harun Farocki’s work *Serious Games III: Immersion* (2009) demonstrates how Metzinger’s postulates mitigate Sellars’ ontological deficiencies through direct realism, and vice versa. This work is composed of two video channels (Figure 3). On one we see a seminar at the Institute for Creative Technologies, where a VR program is being used by US soldiers who participated in the Second Persian Gulf War (Iraq War). On the other, we view the first-person perspective of the soldiers.

There are various ways of explaining why VR activates feelings and affects previously experienced by these soldiers, such as the notion of trauma in psychoanalytical terms. Nonetheless, folk-psychoanalytical notions of the unconscious can be analyzed in a humanistic way, thereby avoiding Metzinger’s postulates. In Metzinger’s proposition, both the representing system and the represented content – both part of the representational state – are either the system or the content to each other. Through Farocki’s work, which exemplifies this specific kind of experience, we can see “subjects […] transiently identified with a computer-generated external image of it” (2010, 6). Could VR, or to be more precise, computer generative models, be used to stimulate and activate previously lived experiences accompanied by the idea of owning an external body? And, as in the representation shown within the audiovisual format in Farocki’s work, reveal how moving images activate experiences linked to rational subjectivity?

In this specific example, Farocki’s artwork shows soldiers processing a way of activating a specific reality through PSM, a scientific ontology of mind within nature in a non-master-slave position. The meta-representation of *Serious Games III: Immersion* can not only be understood through Metzinger’s ideas, in the way in which this project represents the activation of self-consciousness patterns, but can also be understood in Sellarsian terms, with both rational subjectivities as social beings with previous experiences, and phenomenal selfhood as scientific beings living together in the constitution of these phenomenological states. The activation of human self-consciousness and rational subjectivity entities through VR goggles provides a sense of ownership. Taking this understanding into account, the VR-generated models presented in Farocki’s work have elicited tacit knowledge and would not have the same effect on people without the same previous experience: the neuronal structures of people who had not fought in the Iraq War would not be activated. From a Sellarsian perspective, some differences exist between the neuronal mechanisms of a soldier and civilians. Therefore, rational subjectivity has to be considered as another parity level that is interrelated with application phenomenology in selfhood.

Farocki's work connects with an issue raised by Armen Avanesian and Luke Skrebowski on “what aesthetics and art might have to do with each other in the contemporary moment” (2011, 3). A major inducement for new forms of post-contemporary art is the effect of current images in the economy of distribution. According to Avanesian, fields such as neurosciences and computer sciences, as demonstrated by the work of Gollob and Farocki, are part of the potential paradigms for conceiving new forms of aesthetics and the effect of art proposals on the economic network (2017). Approached from a non-correlationist perspective, these two examples have enabled the configuration of a paradigm that escapes Marcel Duchamp’s subject/object interrelation and allows us to move beyond the foundationalist notion of the given. Due to the self-objectification and self-knowledge of the human being, freeing ourselves from the «autarchy of thought» brings us nearer the naturalist-materialist condition and enables us to attend to new aesthetic premises for a post-contemporary art agenda.
Conclusion

The critical realist perspective of Wilfrid Sellars enables us to differentiate between rationalism and naturalism. A revision of his critique of foundationalist ideas opens the possibility of a post-contemporary art agenda that goes beyond correlationist relations in experiencing and making pieces of art. Sellars’ separation of epistemology and ontology allows us to engage with human behavior and mental activity as elements of nature.

Through Thomas Metzinger’s theses, when the master-slave relation between rational subjectivity and scientific selfhood is discarded, the manifest and scientific images are integrated into Sellars’ notion of stereoscopic vision in a parity, non-overlapping interrelation. The first artwork example presented here, Doing Nothing with AI 1.0 by Emanuel Golob, has been approached in this text through the perspective of escaping the completeness of the aesthetic experience via the act of thinking. In this sense, this sculptural neuro-reactive installation is based on the neural activity of the audience, allowing for the fact that mental information is part of nature. Data is compiled and processed by an AI-driven generative machine learning to perform millions of movements that do not depend on human interpretation.

Going further to resolve the ontological inquiry initiated by Sellars, Thomas Metzinger’s phenomenological approach, demonstrated through such experiments as the rubber hand illusion, has elucidated the complexity of how PSM represents the world by activating our biological mechanisms, which are transparent when interacting with the world. Devices such as VR goggles have been used in Metzinger’s research on phenomenal states, as is the case in Serious Games III: Immersion, a work by Harun Farocki that also escapes the subject/object dualist paradigm of contemporary art to provide a glimpse of possible forms of post-contemporary art in which the “Myth of the Given” is overcome.

These two artworks provide an overview of the confluence between the theories of Wilfrid Sellars and Thomas Metzinger, and challenge the role of artistic practices at a time when the ability of correlationist perspectives to understand our current worldview has been exhausted. In addition, these post-contemporary aesthetics have created opportunities within the field of art to explore the enhancement of cognitive conditions and the possibility of a new comprehension of ourselves within the world.

Acknowledgements

My most sincere gratitude to Bassam El Baroni (specially him), Peter Wolfendale and Mohammad Salemy who helped me in the elaboration of this text. I am also grateful to Joanna Baines for her careful copyediting of this essay.

The research on this text has been financed thanks to the project Ontologías híbridas: objetos científicos y culturas visuales entre la industria, la clínica y el laboratorio (PID2019-106971GB-I00), the Universidad Europea de Madrid, the Complutense Research Group Investigación, Arte, Universidad: Documentos par un debate (UCMGR17-970772) and the USAL Recognized Group of Research Conexiones y extensiones de la escultura en el s. xx y s. xxi (Escultura expandida) (CEXE).

References


Sellars, Wilfrid. “Empiricism and the Philosophy of Mind”. In: Herbert Feigl and Michael Scriven (eds.). The Philosophy of Science, Vol. 1: The


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Miguel Ángel Rego Robles
Universidad Europea de Madrid and Escuela Universitaria de Artes TAI
miguelangel.rego@universidadeuropea.es