SPATIAL DISCLOSURE THROUGH PERSPECTIVE DRAWING

On the genesis of 'new spaces' and (in)sights

Eva Beke
KU Leuven, Department of Architecture, Campus Sint-Lucas Ghent, Belgium
eva.beke1@kuleuven.be
Jo Van Den Berghe
KU Leuven, Department of Architecture, Campus Sint-Lucas Ghent, Belgium
johan.vandenberghe@kuleuven.be
Thierry Lagrange
KU Leuven, Department of Architecture, Campus Sint-Lucas Ghent, Belgium
thierry.lagrange@kuleuven.be

Abstract

Since the renewed interest in pictorial depth in the late 13th century and the invention of the mathematical method of perspective in the early 15th century, the perspective drawing has foremost be employed as a tool for two-dimensional representation. However, this paper argues that it could play an active role as an instrument for two-dimensional production through which new spatialities are generated hence further reflections on ways we look at space are provoked.

By taking on architecture in selected Proto-Renaissance paintings as cases, and disclosing what hides behind the fourth wall by the means of the projection method, new three-dimensional contexts emerge. These decors are subjected to a process of hand-drawn perspective interventions combined with modelling and writing, and transform by this chain of actions and reactions in new spatialities that appear to be unpredictable and in no other way conceivable.
Originating from the master dissertation Perspicio (Beke, Van Den Berghe, Lagrange 2017), this early-stage PhD by design, mainly conducted by pencil on paper, requires (self-)reflection in action and a physical embodiment in order to guide the lines that generate new spaces and insights.

The drawn spatialities that take shape before our eyes could tell us something about how space reveals itself to us and about the way perception can be deceptive. We argue that the perspective drawing has the potential to be deployed as an instrument for creating or revealing new spaces, a mechanism used for three-dimensional production as presence. This research investigates the underlying mechanisms of this potential, and the applicability of such mechanisms on a more general level of investigation, production and understanding of 'new space'.

Key words: perspective / analogue drawing / research by design / proto-renaissance / self-reflection

Contextualization

The issue of perspective has always been an ambivalent topic, stemming from a long history with a broad application range. Out of the various types and styles with different intentions that have come about during the cultural development of western civilization, this research confines itself on the (search for) central perspective of the (Proto-)Renaissance and the role it could play today in the generation of 'new spaces' and in reflecting on how we look at space.

When looking back on the evolution of the representation of space in western tradition, particular attention has to be paid to the concept of perspective. The interest for the development of pictorial depth, and with it a more accurate architectural depiction, was reinitiated from the late thirteenth century, the Proto-Renaissance (Burckhard 1868, Auerbach 2003). In this transitional period artists-architects were looking for a way to show more accurately what they see and what they want the onlooker to see. Gradually the iconography from Early Christian and Byzantine tradition evolved from static, hieratic and mystic images, towards a simplified depiction of reality, with a sense of the elegant and the humane (Janson & Janson 2001). Over the years frontal representation evolved towards foreshortened and oblique, resulting in the invention of the geometrical method of one-point perspective by Brunelleschi in the beginning of the fifteenth century in Italy (White 1967). This meant the introduction of the interrelated station point, horizon and vanishing point: the parameters needed to construct a drawing that represents space and proportions geometrically accurate and emotionally credible on a two-dimensional plane. It was around 1474 that the painter-mathematician Piero della Francesca wrote his manual for this new scientific technique of perspective drawing, *De Prospectiva Pingendi* (On the Perspective of Painting). This treatise considered for the first time[1] the intellectual exploration prior to and during the spatial exploration. The operation of thought and the awareness of the (optical) relation between eye, object and surface became shared knowledge (Casale 2016).

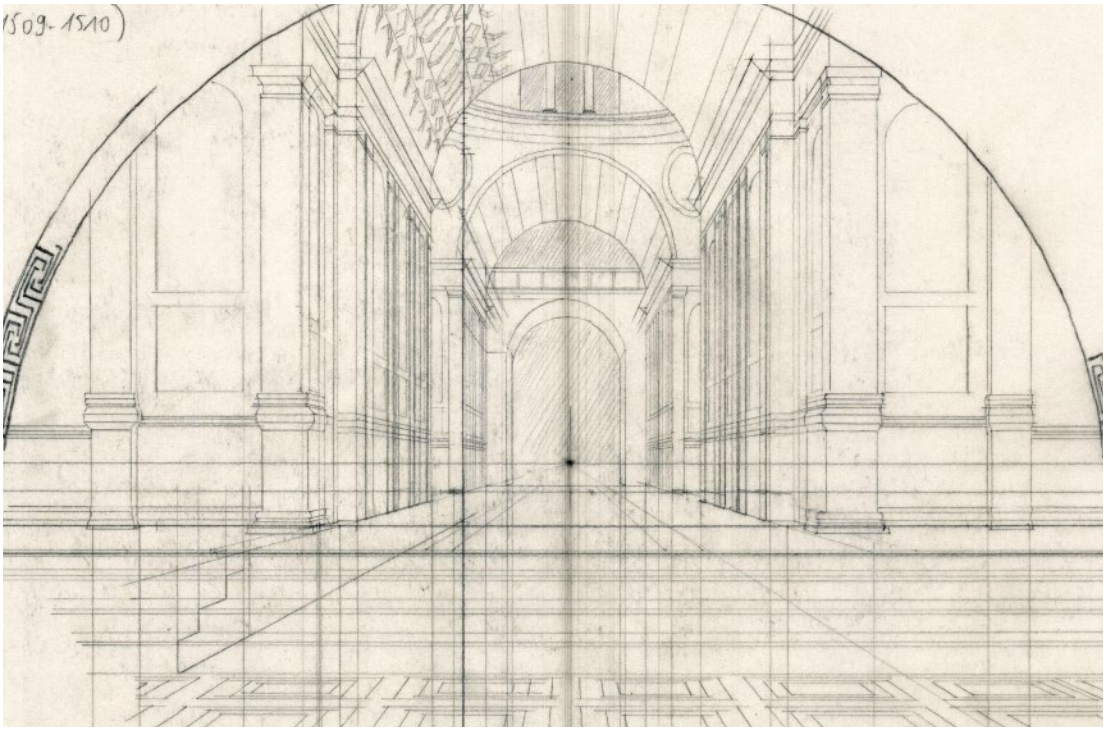
1 Piero della Francesca was not the earliest author of a treatise on perspective. But different from *De Pictura* (On Painting) by Leon Battista Alberti (1435), a theoretical treatise on painting, Piero della Francesca wrote with *De Prospectiva Pingendi* (On the Perspective of Painting) an innovative practical manual on perspective along with its a scientific foundation (Andersen 2007).

Objectives

Returning to this hinging period in history between the late 13th and the early 15th century (including what is called the Trecento), Proto-Renaissance paintings will be selected as cases. The painted (architectural) scene presents itself as the field wherein the researcher can perform his/her perspectival explorations. The current lack of specific architectural knowledge concerning represented but partly hidden spaces will be dealt with. As will the relationship and field of tensions between the traditional way of constructing space in a painting and the reconstruction of the painted space. Frescoes rather than paintings on panel will be chosen for their actual spatial relation with the architectural context they are part of, and will be construed with pencil on paper. This way also the relationship between the historical context and contemporary practice will be questioned.
From these challenges follows the gradual establishment as we go about concretizing the predetermined objectives: a first is to investigate, by drawing plans and perspectives, the depicted space and hidden space in a series of original Proto-Renaissance paintings, situated in their specific architectural setting. This in order to come to a better understanding of these spaces and the relationship with their architectural and historical context.

Thereupon a second main objective is the explorative genesis of new spaces and forms of space through this way of understanding, and learning about their characteristics and observational relation with both the visitor and architect. This genesis coincides with the shift from embedded drawer, as described above, to autonomous drawer who is launched from within the historical context. For there might be an untouched potentiality of perspective drawing to be activated regarding the conception of new spatialities – provided that a critical self-reflection is introduced. Perspective has most of the time been utilized as a two-dimensional instrument, in a search to come closer to the reality of the world. However, this research argues that the perspective drawing has the potential to be deployed as an instrument for creating or revealing new spaces and as a mechanism used for three-dimensional production as *presence* – next to the initial use for two-dimensional *representation* –, engaging its rules for constructing a view as a spatial propeller. This research aims to unveil these underlying mechanisms, and their eventual applicability in the exploration, production and intersubjective understanding of 'new space', by the means of drawing by hand.

Throughout the whole research the significance of the role of the (subjective) Self in these processes, and the importance of analogue architectural drawing in a context of digitalization will be valued.



detail from projection 'The School of Athens' by Rafael (Beke 2017)

Research origins

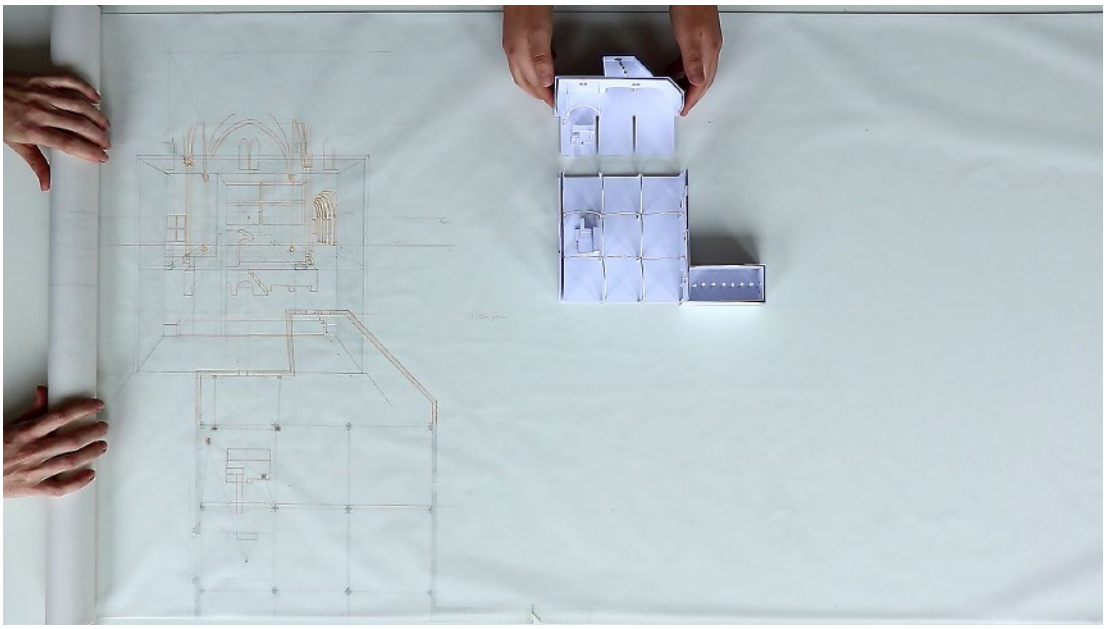
This research project intends to go behind the picture plane, the two-dimensional surface on which a three-dimensional scene is depicted. By taking on architecture in selected (Proto-)Renaissance paintings as cases, and disclosing what hides behind the surface by the means of the projection method, new 3d contexts emerge. The fourth wall can be permeated, and since the frontality is bypassed, the registered space is now a three-dimensional place that can be approached from different angles. The master thesis *Perspicio* (Beke, Van Den Berghe, Lagrange 2017) already allowed developing a first series of explorations, starting from the work of Bramantino (The Adoration of the Kings, about 1500), Antonella da Messina (Saint Jerome in his Study, about 1475) and Giotto di Bondone (Expulsion of Joachim from the Temple, 1304-1306).

By reversing the projection, plans and sections could be obtained from the painted surface, providing us with a fictional space that can be walked through. The architectural decors, extracted from the paintings, were subsequently subjected to an empirical process of hand-drawn perspective interventions combined with modelling and writing, and transformed by this chain of actions and reactions in new spatialities that appear to be unpredictable and in no other way conceivable, but emerging out of patterns that are generated by the lines inherent to the method of projecting.

These first productions act as the foundation for the more defined doctoral research here presented, which will be dealing with iconographic and iconological aspects, an expansion of the repertoire with cases to be researched, and the continuation of new spatial production.

In so far this early-stage research project has progressed, a literature study has been conducted and a reflective film[2] has been produced looking back on the first series of production. This *Bootleg* (Beke, Van Den Berghe, Lagrange 2017) shows the – literally – unwinding of the design driven research discourse: a roll of tracing paper, containing the first drawn results and related models, is manually retracted showing the pictorial explorations.

The following step revolves around the next cases. These cases – specified further on in this paper – are deliberately chosen and preliminary studied by the means of literature and drawing for the purpose of setting up a fieldtrip to experience these paintings in their actual spatial context. This primary examination within the framework of a specific past, characterized by its layered complexity, is essential to be able to distill particular aspects that will play a part in this more explorative and sensitive approached PhD project.



still from Bootleg, Perspicio (Beke, Van Den Berghe, Lagrange 2017)

2 link to *Bootleg* (Beke, Van Den Berghe, Lagrange 2017): https://vimeo.com/250011509

Method

During the master thesis the cases were foremost selected on an intuitive basis. Paintings that appeared to be interesting and challenging were chosen, enabling to explore works from different types and times, out of curiosity. The following research cases, however, do meet certain criteria that lend a greater focus regarding place and time to this PhD project, but still the aspect of intuition will be included. In *The intuitive practitioner* (2001) Guy Claxton describes the rehabilitation of intuition as largely seeming a matter of regaining balance: 'the balance between effort and playfulness (…) and the balance between intuition itself and reason.' Or as mathematician Henri Poincaré claimed, 'It is through logic we prove; it is through intuition we discover' (quoted in Claxton 2001). Considered as implicit knowledge in an indispensable preceding stage of explicit knowledge, intuition will retain its importance in this PhD, but now framed in a more specified context.
For this the research tends toward the fascinating period of Trecento, where artists wanted to break out of the rigidity and two-dimensional tradition, and became aware of the possibilities of depth. These paintings, dating from before the linear perspective was invented, may seem more simplistic and primitive, as opposed to the harmonious paintings of the Renaissance, but in fact they might even be more complex and spatially intriguing. The artists started experimenting, looking for a solution to deal with the conflict of the solid and the surface (the large-scale, three-dimensional, lived medium of architecture versus the small-scale, two-dimensional, fictive world of a painting), resulting in fascinating architectural 'objects', that may play a role in the story of the painting, rather than just providing a background for the protagonist.

Leading us to the (personal) selection criteria as listed here: for a case to be selected it should be (1) an Italian early Renaissance painting, where (2) architecture is represented – with its time-related defects and deformations. It should be (3) a fresco, so that it is a big compositional organization, embedded in its architectural context. This way the painting has its fixed position and orientation in a bigger whole, in relation with other depictions. As opposed to a (relocatable) panel painting, which can be less physically related to or defined by its built setting. And (4) preferably it should be part of a cycle. So that the different frescoes are not only organized as they are because of mere formal aspects, but also because of the narrative that binds them and that can provide the drawer with a motive to define the starting position, making use of the constructed *détour* of fiction as a method to gain understanding of 'the real'.

Based on the aforementioned criteria the further selection of cases will be done and finetuned through *coding*, a method borrowed from Grounded Theory Research (Corbin and Strauss 1990, Charmaz 2000, Charmaz 2006): *open coding, axial coding and selective coding.*

Once the represented architecture has been studied (through literature review and site visit) and transformed via projection from a plane (2D) to a solid (3D) – the perspectival projection method as hinge between the idea and the experience –, the three-dimensionalized space will be subjected to a first round of hand-drawn perspective interventions, alternated with modeling and annotating (*memo writing*). These interventions, that constitute the *open coding*, are directed by application of the rules implicit in the geometrical method of perspective drawing.

Focus will be developed through *axial coding*. Tracing the projection lines and sight lines, defines gradually unforeseen patterns and new spatial constructions. This transformation seems to be unpredictable, and apparently ensuing from this chain of drawn actions and reactions that are the result of a sensible form of intuition (Claxton 2001).

The fictive field of the three-dimensionalized painted architecture itself provides the motive for the actions and reactions that take place. It is the narrative of the painting (to which depicted architecture often metaphorically refers to (Lillie 2014)) that acts as the catalyst for the perspectival intervention. In this manner the cases behave self-supportively and recursively as spatial conditions are created in accordance with requirements of the story. The assumptions that are made for architecturally supporting and/or reinforcing this narrative (like a stage setting), provide the motive for the behavior of draughtsman and drawing to be determined by the perspectival rules. Drawing is no longer autonomously deciding, but being guided by the mechanism of the projection method and hypotheses that give a guiding orientation to perception and thought, giving the general meaning that allows 'seeing' facts 'as' this or 'as' that (Besse 2001). A position is taken – literally – and subsequently the perspective will determine the directions and generate patterns that create new spaces. The outcome of the new spaces depends on the balance between the mechanism of the technique, to which the draughtsman subjects him/herself to a certain degree, and the authority of this draughtsman, who defines the station point at start and intervenes were required. The delicate balance of authority between drawing and draughtsman demands (self-)reflection in action. The system generates from within, subjected to the rules of perspective that also the draughtsman is highly susceptible to. He/she observes and anticipates on the self-generating processes that take place before his/her eyes, weighing whether to obey or disobey these rules. At this stage, the exact outline of the criteria and their ratio for achieving the required balance and a successful formation of a spatialitiy must be empirically examined throughout the process.

Thoughts on Theme 1: The Act of Drawing

The search that the early Renaissance painters initiated, is in a way continued here. Analogous to what took place more than 500 years ago, this research is exploring the limits of an instrument that today no longer (instead of 'not yet') automatically belongs to the general competencies of graduates. Preceding on what was, it seems only logical to conduct this research by analogue drawing, linked to the explorative drawing practice of that time. This principle of embedding, though not in full aware of the authentic practice and thus in need of other solutions to tackle the gaps one encounters when retracing, will require a strategy and method. Intuition, imagination and memory can therefore become part of the game when deconstructing and reconstructing the pictorial space, bringing about (potentially interesting) anachronisms, but also enabling a sensitive relation with and a way of understanding of the image making.

The invention of photography in the 19th century and the digital revolution that would follow later on, had put an end to the classical painting tradition as it was and slowed down perspectival developments – which does not imply that further developing would be dispensable. In the current architectural education the focus is foremost concentrated on drawing digitally, using commando's that draw lines in the boundlessness of a virtual program. Drawing by hand is barely taught (and possibly underrated?) in the architectural training of today, hence the challenge for this investigation of self-teaching, facilitated with an *old school* drawing table, those techniques that were still obvious for the students of merely some decades ago.

Retracing those steps in this stage of the research has several consequences, whether of practical matter or personal (both mentally and physically) impact. On the one hand there is the size of the drawing related to the size of the medium. Once the first lines are drawn, the position and scale are set. It is thus of great importance to reflect on the intended drawing on beforehand and already consider by imagining and calculating how it would fit the bearer. A second practical difference with digitally obtained images is the number of lines. There is a (sometimes even confusing) multitude of lines when doing a perspective projection by hand. Besides the lines that trace the architectural forms, the sightlines, projection lines and orthogonals converging towards the vanishing point also remain visible. This way the process is literally represented, and unforeseeable patterns may emerge and become part of the newly constructed space, addressing the indirectly forming potential of the perspective mechanism.
These limitations ought not to be considered as disadvantages. Not only do they help provide in the generation of new (forms of) spatialities, but the slowing act of drawing may be rather a process related hence not merely a product related activity, which leads us to the personal impact of drawing. This process related nature much more, i.e. longer in time during the drawing process, brings about embodiment. Constructing embodied knowledge requires periods of embodiment that last long enough. Embodiment, here, is indispensable because the experience of space, hence the conception of space, is also physical. The direct link between mind and hand affects both a physical as well as mental involvement and addresses a depth and intensity, crucial to a conscious genesis of new spaces and a further development of The Architectural Drawing (TAD) (Van Den Berghe 2013, 2015, 2015, 2018) via *Critical Sequential Drawing* (Van Den Berge, Sanders, Luyten 2018). With the drawing almost as a physical extension to one's body and no possibility of 'zooming' within the set scale, drawing becomes walking, and what the draughtsman compellingly sees is what the draughtsman compellingly gets. This helps to both physically and mentally inhabit the imagined, inviting the Self to consciously overthink and interact, and enabling the guiding hypotheses to be tested. (Besse 2001).

Thoughts on Theme 2: The Act of Looking

The spaces arise from a continuous interaction between planimetry and a certain sight from within in the form of a perspective drawing. This sight is determined by the position of the draughtsman, his orientation and eye level. When drawing a linear perspective a station point and a vanishing point are defined, two coordinates upon which the whole spatial construction is founded and thus decisive for the perception of distance and proportions. The experience that can be derived from this one specific station point, shapes the expectations in regards to all the other points of view. Man is preprogrammed to identify systematically the harmonious or symmetric, and hence preprogrammed to expect it (Sternberg & Sternberg 2009)[3]. When a station point and projection lines determine a drawing, and in extension the spatial development (for they are inextricably linked through the interaction between planimetry and sight), all the other views will be affected and their reality will not always be instantly reconcilable with their appearance, for the onlooker's perception will change when changing position. The completion of space takes place while making an architectural promenade, moving from one station point to another. When spatial explorations in pictorial depth result in an experience that doesn't meet visual expectations, then the estranging elements impact the space and create non-conventional tensions. The distortion, firstly appearing to be logical,

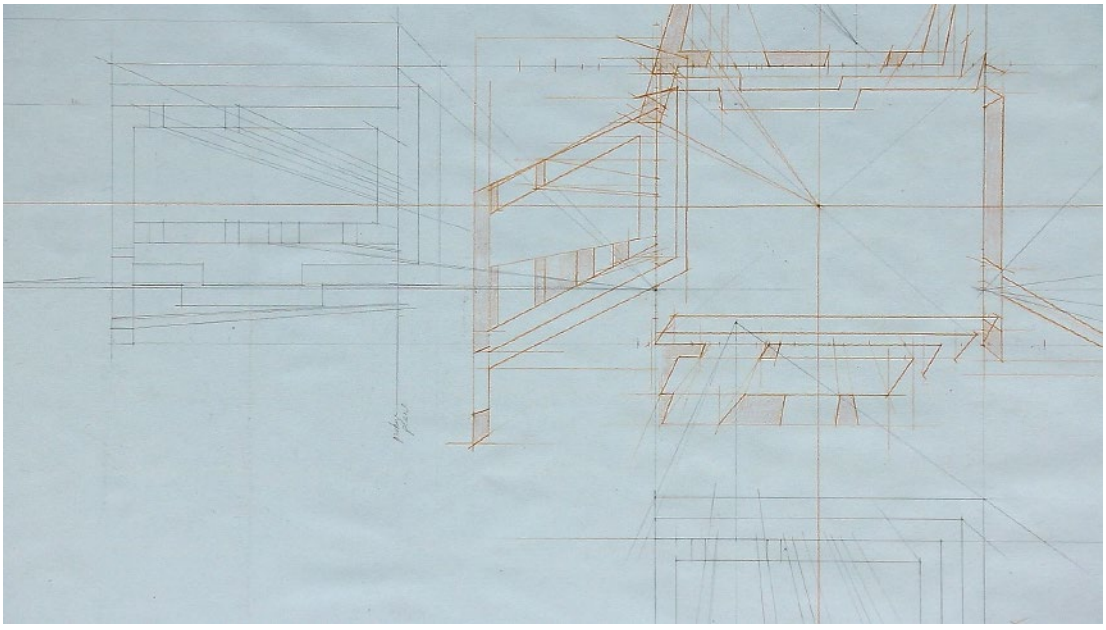
3 The Gestalt psychology in the 1920s (founded by Kurt Koffka, Wolfgang Köhler and Max Wertheimer) studied the visual perception and developed the law of *Prägnanz*. One Gestalt principle that is described by this overarching law is the principle of symmetry, which states that man tends to perceive objects as forming mirror images about their center (Sternberg & Sternberg 2009).

now causes to doubt, and attempting to comprehend it will cause to waver. This disorientating game of viewpoints can make the onlooker slow down, inciting him to look with an improved awareness, in an attempt to understand the destabilizing provocation and the relationship between the registration that the eyes transfer to the brain and the body that has its own specific position and orientation in space. Perception, and vision being regarded as self-evident, are questioned in a space that is unconventionally composed, breaking free from orthogonality. In *Meaning in the Visual Arts* Erwin Panofsky (1983) states "…that much is in the senses without ever penetrating into the mind. We are chiefly affected by that which we allow to affect us…", implying that awareness is an initial step towards the obtainability of (spatial) insight, for there is generally *more than meets the eye*.

A first critical stance has to be adopted towards the way we perceive historical images today and the role of linear perspective, for art historian Michael Baxandall's concept of the 'Period Eye' (1972) points out that our vision is a cultural construct, based on skills and social habits. Different interpretations related to what was historically intended and actually perceived are a posteriori projected and attached to the experience of the painted image, influenced by the visual training and cultural equipment (Panofsky 1983) we are affected with today as opposed to at the time. It is important to consider that "understanding the picture depends on acknowledging a representational convention" and to relate the pictorial style to the corresponding cognitive style (Baxandall 1972).

A second aspect that is to be approached with some suspicion is the deceitfully scientific position that linear perspective holds within our modern Western cognitive style - even though this seems to be transforming in recent years towards a more aerial view (Steyerl 2012). The paradigm of linear perspective is often improperly regarded as the truthful representation of reality (Panofsky 1991). Instead, it is an intersubjective tool of communication, operated to project the vision of one person: the one in charge of placing the station point. The (abstraction of) the draughtsman's body in the space stipulates the spatial outcome; draughtsman becomes architect.

The drawn spatialities are capable of telling us more about the deep nature of (fictive historical) space, about the way we look at it today, and eventually about the conception of innovative spaces. In this way, they act as The Analogous Spaces (TAS) (Lagrange 2011, 2016) since they are able to unveil the intangible as a crucial part of our beholding. These new decors can work as looking machines that permit us to reestablish this conscious way of looking and drawing, essential activities for architects, in architecture practice and learning environments, with regard to the conception of space and architecture.



still from Bootleg, Perspicio (Beke, Van Den Berghe, Lagrange 2017)

Upcoming

As has been said, the next step is to delve into the selected cases to study. A fieldtrip to visit (the first) two specific cases is planned, to have the crucial experience of beholding the paintings in real life, and not solely their representations on paper or on a screen. The first cycle to witness in its own context, as was meant to be, is to be found in the Upper Church of the Basilica of Saint Francis of Assisi, where both sides of the nave are decorated with frescoes that tell the story of Franciscus in one horizontal band, dating from the 1290s. The identity of the artists is disputed, and can only be assumed, but art historians agree that there were several, based on the different styles of painting. Also clear is that one person must have been in charge, who kept an overview on the whole organization of the cycle and its coherence (White 1967). The second case on the list is the Arena Chapel in Padua, of which we know for sure that the frescoes are by the hand of Giotto, conducted around 1303-1306. Here the lives of Christ and the Virgin are depicted over the whole space in three horizontal layers. The biggest difference between the fresco cycle in Assisi and the one in Padua may lie in how the building itself impacts their formal organization. In the first one, the Upper Church of the Basilica of Saint Francis, the nave is ordered in different bays, plastically divided by columns. In every bay three or four frescoes are applied per wall. They are mutually formed in order to be balanced within the three/four of them, and referring to a center in this particular bay. Every bay has its own center, hence in this case it is all about being part of a whole. The Arena Chapel, on the other hand, has no dividing architectural elements in its interior. The whole chapel acts as one. The cycles that are on these walls are thus more individual, and all referring to only one center (station point) in the middle of the chapel. The two different approaches towards the pictorial strategy (depicted space) within their distinct contexts (built space), approximately dating from the same time, are expected to shine a first light on various aspects, as above mentioned – including the genesis of new analogue spaces (relative to historical conceptions), the self-reflective character of the researcher while looking in a specific way and acting accordingly, and the meaning of the architectural drawing (by hand) in all this as a generator of the creative process.of the creative process.

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