Vision and Depiction

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book of abstracts

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Texture

Designing Knowledge: Theoretical Considerations on Information and Decoration in Prehistory

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Within oral societies, artworks often function as Artificial Memory Systems (AMS), technologies designed for recording, storing, recalling, and transmitting complex information. Aided by these artworks, as well as other AMS and mnemonic strategies, Indigenous groups have accurately recorded information in prehistory and preserved it up to the modern day. It is, therefore, not unreasonable to assume that many prehistoric artworks and decorated objects, recovered from the archaeological record, functioned as AMS.

Whilst the 'function' of the earliest art has long been discussed by prehistorians, much of this debate is speculative. In recent years, there has been a move towards developing analytical frameworks for detecting AMS in the archaeological record, rather than simply forwarding 'umbrella' theories of their 'meaning'. However, these are currently limited to identifying systems of notation (e.g. 'tallies') and cannot help us recognise artworks that may have been used to record and recall other types of information. Additionally, the theoretical foundations of these frameworks are almost always built entirely upon ethnographic data which is undeniably valuable but notoriously limited.

This paper aims to build on these approaches by synthesising ethnographic observations and archaeological theory with neuropsychological data, providing a more robust scientific foundation for our framework. It will be argued that art as AMS is typically comprised of abstract asymmetrical designs that are 'multisensory', in that they combine visual and haptic elements. Asymmetry commands cognitive attention and allows users to 'hack into' their spatial memory (Method of Loci). Whereas combining haptic elements will initiate the user's tactile memory, which is known to interact with other sensory inputs when recording and recalling information.

This theoretical framework is a step towards a falsifiable model for identifying AMS archaeologically and will allow researchers to make more informed interpretations about the functions of prehistoric artworks and decorated objects.

Eidolons ...

Jan J. Koenderink, Andrea J. van Doorn
KULeuven

There is an aesthetics of Photoshopped baby bottom smoothness and there is an aesthetics of rough Tri-X grain or palette knife finishing. This is immediately related to two key properties of any successful picture. Not only should it look better than the wall behind it, it should CATCH the eye and HOLD it, forcing the eye to return again and again. The main enemy of art is boredom. Overall composition serves to CATCH the eye, whereas texture, pattern, theme and variation serve to HOLD it. These issues play mainly on the sentient mind, rather than reflexive thought. In order to open the sentient mind the sapience should be gently exercised - whether by trivial stories or "deep meaning" doesn't matter.

Sentience is a hunter that hunts for meaning. Hunting is fun but after a catch boredom sets in. The hunter needs to constantly catch glimpses of a prey but should not be allowed to catch it. The artist tickles the creative imagination but should not let it arrive at conclusive images.

Related are mutually orthogonal, bipolar dimensions of composition (notan, macchie) and detail (pattern, texture), and of structure (hyletic content) and meaning (noetic content). Jackson Pollock proved such is possible with purely formal means. Visual perception deals with spectra of scale, resolution and various contrasts (patches, edges). Powerful stimuli can be based on an emulation of the hyletic chaos in pre-awareness that coheres into drops of awareness due to partly understood processes of psychogenesis (Koenderink - Eidolons, JOV2017).

I demonstrate an example that proves addictive to children (grownups too).

The fundamental building blocks of human texture perception.

Robert Kentridge, Liam Norman
University of Durham

What are the fundamental building blocks of texture perception? For shape the answer is intuitive - we start with oriented line segments and combine them together to form T or L junctions or lines meeting at specific angles. These can then be combined repeatedly to form more complex shapes. Textures extend across space, so the building blocks of texture perception are likely to be image statistics. Cells in human primary visual cortex are selective for line orientation and spatial frequency. The fundamental building blocks of human texture perception could therefore be statistics of orientation and spatial frequency. Evidence exists for mechanisms in the human visual system selectively tuned to such statistics. Norman et al (2014) demonstrated selective adaptation to orientation variance independent of its mean. We present results showing adaptation to spatial frequency variance. If such mechanisms drive texture perception, we should be able to predict judgements of the similarity of pairs of textures from differences in their image statistics. The University of Edinburgh have made a database of 334 textures, together with a confusion matrix showing the judgements a group of observers made

of the similarity of 1024 pairs of textures. We measured the mean, variance, skewness, and kurtosis of spatial frequency and orientation power in each of the images (orientation statistics are circular), and the difference in each statistic between images in each test pair. These differences were used to create a generalised-linear-model of similarity judgements. Eight differences, or interactions between differences were statistically reliable. The most powerful, measured as standardised coefficients, were mean and variance of spatial frequency differences and variance and kurtosis of orientation difference. In conclusion, statistics of spatial frequency and of orientation provide a useful basis for predicting our perceptions of texture.

Material perception across different media - comparing perceived attributes in paintings and engravings

Yuguang Zhao, Jeroen Stumpel, Huib de Ridder, Maarten Wijntjes
Delft University of Technology

Before the invention of photography, paintings were reproduced in a graphic and linear medium: engravings. The reproduction practice allows for a comparative study of material perception between these two media.

We collected 15 pairs of oil paintings and their engraving reproductions. Then we selected 88 elements from these 15 pairs, including fabric, skin, wood and metal. Besides the original condition, we created three manipulations to understand the effect of colour and contrast. First we created a grayscale versions. Secondly we equalised histograms (towards both painting and engraving, hence two versions) while blurring them, as a 'sharp' engraving is a bitmap with an unsuited histogram. We performed rating experiments on the five attributes three-dimensionality (3D), gloss, convincingness, smoothness and softness. An average of 25 participants finished each 20 online experimental sessions (5 attributes X 4 conditions).

All sessions show significant positive correlations, indicating these two media elicit similar perception for the five attributes. In other words, engravers did a decent job to replicate the oil paintings and provoke similar material perception in the five attributes we tested. The differences between oil paintings and engravings mainly show in their means and standard deviations (perceived range). Different means indicate different levels of perceived attributes. (i.e. Higher means for engravings in grayscale condition for 3D indicates that materials were rendered as more three-dimensional by engravings.) Different standard deviations indicate different perceived range of certain attributes. (i.e. Original paintings could render wider range of gloss than engravings.) In most sessions (17/20), paintings have wider range than engravings, 5 of them are significant. In addition, it was the histogram matching that made the most changes in attributes rendering performance, rather than color removal.

Knowing through making

Analogies: When I Draw a Song for a Film

Dejan Grba
University of the Arts in Belgrade

This generative drawing project explores the blending of unrelated cognitive paths into new matrices of meaning and discovery through abstraction, relationality, and analogy-making. It was sparked by the joy of connecting certain songs to the films where I heard them (not necessarily for the first time) and vice versa, recalling certain films by songs featured in them.

I formalized the intersections of music and cinema using a simple technique that visualizes sound through its mechanical energy. The radial asymmetry of lateral sound pressure forces produced by the vibrations of an efficient, free-standing speaker driver will move it around on a horizontal plane, which can be used for drawing. I selected 31 songs that I strongly associate with films in which they appear as diegetic or non-diegetic music and played each one full-volume over a light wireless speaker with a side-attached pen touching a paper sheet fixed on a leveled surface. This setup has no accuracy or reproducibility of scientific experiments, but with some care, it can be tuned up to render consistent traces of a chosen song.

To contextualize the sonic "seismographs" and reveal their visual subtleties, I scaled them up, added positional markers and essential song/film data, and printed them in high resolution. The exhibition features all prints, the playlist of their source songs, and two videos: a drawing process demo and a songs-in-films sample reel. With a range of inspirations and references in sound art, generative art, and computational art, this work leverages the mental broadness of vision and the material openness of depiction to celebrate the power of analogy-making surprises at the core of all creative processes.

Project link: https://tinyurl.com/dg-analogies

Depicting Truth through Deceit: the role of the faux altarpiece in the Portuguese mural painting.

Patrícia Monteiro

School of Arts and Humanities of the Lisbon University

The faux altarpiece is one of the most popular morphologies in Portuguese mural painting, bearing witness to a wide State of Art that can be traced back to the late 15th century until the early 19th century. Economic factors contributed to its remarkable durability, particularly in the country's periphery, since it was easy to duplicate more expensive materials simply by using trompe l'oeil. After the Council of Trent, the potential of the altarpiece to be used as a structure for the exhibition of other artefacts (paintings or sculptures) made it a privileged vehicle of communication between the Catholic Church and the population. The same reasoning can be found in the faux altarpiece: while depicted as a holding framework for other objects (both real and fake), the structure was, at the same time, being "held" by the wall itself, creating an ambiguous threshold between reality and fiction. As a result, the fictitious altarpiece has a dual nature, serving as both a represented object (via mimesis) and an instrument of representation, thus generating multiple dichotomies: material/immaterial; true/false; human/divine. The strategy of "opening up" specific spaces (niches, windows, frames) within the mural composition for the display of other images, through trompe l'oeil, gave way to a new dimension in which the observer played a specific role in the distinction of what was real from what was not. It is up to the viewer's gaze to build the link between fictional and real dimensions because, as Victor Stoichita has already stated, only the observer is capable of understanding them both at the same time (Stoichita, 1999: 29). In this paper, we will explore the threshold between truth and illusion, enhanced by the massive presence of faux altarpieces in the 17th and 18th Portuguese mural paintings.

Against Repoussoir: An Exploration of Knowledge through Making

Catelijne van Middelkoop

Delft University of Technology, Willem de Kooning Academy

This paper delves into the realm of art and visual communication, challenging traditional notions of composition and perspective through the lens of the artwork 'When Images Remain: A Visual Polemic in 8 Acts' (2023). This innovative work transforms repoussoir elements, such as figures and trees typically relegated to the composition's periphery, into central focal points, akin to boundary objects that bridge diverse social contexts and facilitate communication among them.

Drawing inspiration from John Baldessari's call to "look between" objects, this study investigates the convergence of images from various temporal moments, unveiling unexplored territories within visual narratives. By curating historical glass lantern slides from the heritage collection and digital images from an art-based learning course at TU Delft, a grid of context-independent images emerges. These individual images relinquish their prominence, giving rise to eight distinct scenes that invite fresh perspectives on the interplay between visual stimuli, memory, cognitive construction, and imagination.

The paper's title, a fusion of 'repoussoir' and Paul Feyerabend's 'Against Method,' alludes to its central thesis: the embrace of (overlooked) epistemological anarchy within the realm of knowledge. In this context, 'anarchy' signifies the pursuit of intellectual freedom, rejecting the constraints of a singular, prescriptive scientific method that stifles alternative pathways to knowledge creation.

In an age of burgeoning advancements in generative artificial intelligence the creative process takes center stage, emphasizing the transformative potential of images in generating novel perspectives and redefining the significance of individual design elements, as well as the act of creation itself. This paper delves into the collaborative process behind the artwork that revolves around the concept of the 'space in between.' In doing so, it challenges conventional roles of text and images in the production of knowledge, reshaping our comprehension of history while envisioning a new future through making.

Drawings as Cognitive Artefacts

Jens Dam Ziska
University of the Faroe Islands

This paper is excerpted from a longer project on the nature and epistemic value of drawing. In this part of the project, I argue that drawing is properly characterized as an epistemic action that changes the physical world in ways that simplify and redefine cognitive tasks such as registering, remembering, and communicating the look of something. For the same reason, we should not categorize drawings as mere artefacts. Rather, drawings are cognitive artefacts that extend our mental powers in unique ways. Whereas photography is often said to extend perception, drawing extends our capacity for gesturing which is itself an epistemic action. After characterizing the ways in which drawing extends gesture, I consider the variety of epistemic virtues that drawing has vis-à-vis photography. I argue that while photography has the advantage of being able to deliver demonstrative evidence, drawing has other epistemic virtues that are more advantageous in certain contexts of use. In particular, drawing can express a much broader range of contents than photography. Drawing is also better suited to represent and communicate the significance of certain types of evidence. Finally, I argue that because drawing extends the capacity for gesturing, drawing is also an important source of self-knowledge. Drawing are not merely iconic signs. They are also indices of agency which disclose the embodied way in which a work was made and what sort of person made it.

Critical Neuroart: A Neurocultural Reading of Robert Morris' Self-Portrait (EEG)

Nim Goede
University of Amsterdam

Recent decades have witnessed the rise of a neuroculture in which neuroscientific knowledge permeates our daily lives, social practices and intellectual discourses. Also artists have taken an interest in the brain, creating artworks that incorporate neuroscientific tools or concepts. I argue how what I call "Critical Neuroart" can enact critical interventions in neuroculture that question its taken-for-granted ideological presuppositions and unveil hidden processes of boundary-work (i.e. the assumed separation between brain and body). These interventions open up a space for the viewer to relate to these neuroscientific tools and concepts, but also to their own brain, differently. As such, Critical Neuroart can be a valuable tool for (disciplinary) self-reflection for both neuroscientists and laymen alike. As an early example of Critical Neuroart I will discuss Robert Morris' Self-Portrait (EEG) (1963). For this ironic self-portrait Morris "thought about himself" for the time it took the encephalograph to inscribe a line equal to his height. In the art historical literature this work is read as reacting against the "tenacious Idealism" within mid-century art critical discourse in which the idea behind the work is thought to exist in a Cartesian mental space separate from the physical space of the artwork. Inspired by thinkers like Ludwig Wittgenstein and Maurice Merleau-Ponty Morris' work promotes a situated and embodied account of subjectivity instead in which these subject-object and mind-body dichotomies are problematized. What this art historical interpretation omits from consideration, however, is Self-Portrait (EEG)'s embedding within a nascent neuroculture. Linking the work to key events in neurocultural history affords a reading that posits the work as simultaneously (and paradoxically) reacting critically against the tenacious Realism inherent to a neuroculture in which the mind-body problem is simply supplanted with the brain-body problem.

Keynote collective I

Sketchy, Tiny, Black-and-White. An Ecological Approach to Depicting the World in 17th Century Visual Education and Today

Ann-Sophie Lehmann
University of Groningen

The depiction of real-world objects and the subsequent perception of such pictures fundamentally relies on the comparison to that world. One goal of depiction is to produce mimetic imitations (oil painting, VR, 3D modelling, Digital Twins) that carry the apparent potential of replacing that which is depicted: they employ the strategy of emulation. Depictions can also use an opposite strategy – reduction – which draws on the human capacity to identify objects from very few visual-material clues. Such tiny, sketchy, low-res, black-and-white pictures do not rival real-world objects but draw attention to the physical presence of the depicted. Instead of replacement, they afford attention for the surfaces, colours, structures, and detailedness of that which is depicted and therefore sharpen the perception of and appreciation for the real, everyday object. The comparative appeal of less-appealing images holds a pedagogical potential that was put to use in 17th century sense-based education. In the age of high-end digital visualization, low-res images are being re-discovered because of their low environmental impact. Thus, they draw attention to aspects of the real world in a different yet equally ecologically informed manner.

Trapping the Objectless

Evelina Domnitch, Dmitry Gelfand

Through the lenses of phenomenological art and the second quantum revolution, the duo will discuss the role of quantum analogues in their artistic practice. Enabling direct observations of exotic physical phenomena, these artworks prod the slippery frontiers of perceptibility, objectification, and quantum simulation.

Space and motion

Motion and layout depiction using 2D/3D animation tools

Melvin Even, Jean Basset, Pierre Bénard, Pascal Barla
Inria

Still paintings and drawings are endless sources of fascination, not only due to the diversity of styles employed by artists, but also thanks to the way shapes, materials and space are conveyed with an economy of means. Likewise, traditional 2D animations (i.e., where each frame is drawn by hand) convey 3D motion and layout with a few carefully chosen lines, striving for legibility and expressivity rather than realism. However, producing traditional animations requires tremendous skills, time and dedication.

We explored two different ways to help produce such animations on computers. The first method starts from a few 2D key drawings, and generates intermediate frames through interpolation techniques. Here the goal is to progressively increase the complexity of moving and deforming 2D drawing parts until they convey 3D motion and layout cues. The second method works with 3D animations rendered in a line art style, and relies on 3D shape deformations and spatio-temporal perturbations to increase motion legibility and convey a hand-made look.

By analyzing the motion flows produced by these two approaches, we will discuss which structural motion properties may be responsible for the legibility, credibility, and specific look-and-feel of traditional 2D animations. In particular, we hope this will draw the attention of our fellow vision scientists toward the host of visual cues conveyed by the animation medium, and motivate new perceptual studies.

Representing the manifold gaze of architectural spaces

Eugene Han
Lehigh University

This study investigates methods for representing an untethered viewer's visual engagement of architecture. In light of the rapid development of mapping and scanning technologies, it is critical to address both potentials and difficulties inherent in analyzing gaze data across three-dimensional stimuli, particularly within unrestricted and navigable spaces. Unlike the century-long development of eye-tracking analysis on images and otherwise 'flat' surfaces, the representation of eye movements within natural viewing environments introduces a multitude of considerations that are simply not presented in

conventional stationary scenarios. Three technologies were incorporated in order to develop spatial eye-tracking representations. Mobile eye-tracking (MET) spectacles were implemented to record subjects' gaze. In order to map the relative location of a viewer's gaze onto the absolute coordinates of the architectural stimulus, viewers also wore a head-mounted visual simultaneous localization and mapping (VSLAM) sensor to register the changing orientation and position of their heads. Finally, to ensure accurate mapping of MET and VSLAM data, viewed spaces were captured using light detection and ranging (LiDAR). The results of this study showed how the coordinated articulation of eye, head, and ambulatory movements could be consolidated in order to illustrate the subject-oriented nature of a viewer's engagement with architecture. While point cloud data were originally implemented in order to accurately measure viewed spaces, the transparent nature of its rendering proved to be particularly useful in architectural reconstructions according to viewers' area of perceptual interest. It was found that physical engagement had a significant effect on eye movements, particularly in the definition of attentional focus while in motion, as well as the density of overall spatial fixation distribution, underscoring the critical role played by the association of eye and body movements in the determination of our visual gaze within natural viewing scenes.

"Framing" the landscape. Movement, Landscape and Cinema.

Vitor Gomes
University of Évora

This lecture intends to reflect the relationship between time and movement, with the theme of landscape in visual arts and cinema. The human notion of time is intimately linked to the perceptions provided by the senses - with emphasis certainly on the sense of sight - which means that the human notion of time is directly influenced by light and movement. The way in which the physical world is observed, how it registers visually and assumes its visual power is profoundly relevant to the handling of landscape materials in cinema. The terms of the relationship allow experience to be captured in a first-order sense. This happens through the very representational processes that constitute the faculty of memory and time and not as a psychological by-product of the perceptions and thoughts connected with that experience. Landscape involves the isolation of a certain spatial measure and a certain temporal period. In other words, all notions of landscape are produced by human interpretation which, simply due to human physiology or due to political or cultural obliquity, is selective. Subsequent aesthetic treatments of landscape, whether in painting, photography or film, involve further selection, interpretation and omission, whether by an individual or a group. What are the implications of our visual experiences, in a world increasingly centered on gaze, movement and time? Constructing visible fictions and landscapes, cinema appropriates space and time in a particular way through the textures of scenery/space, editing, light, sound and editing. Landscape, as a writing of imagination and social memory, integrates cinema in its permanent movement of recreation and time. On the other hand, cinema, by creating different realities, becomes a powerful intermediary in the construction of the landscape itself and its time.

Freehand sketching of 3D shapes and implications for computer-aided design; an overview of a multi-disciplinary collaboration

Adrien Bousseau[1], Mark Sypesteyn[2], Jan Willem Hoftijzer[2]
[1] Inria;[2] Delft University of Technology

Designers depict 3D shapes on a daily basis, during all stages of the design process (ideation, concept development, engineering, presentation). This depiction is established either with freehand sketching or with more involved computer-aided-design tools.

While CAD systems offer more precision and definition (high fidelity), the downside is that the creation of 3d shapes takes more time and does not often allow for creative exploration.

Freehand sketching offers quick and low-cost/low-risk investigation of ideas and solution spaces, while the risk is that these sketches are too low in fidelity to be of trustworthy use in the design process. E.g.: a CAD engineer might not be able to use the sketches to create a 3D model. A thorough design sketching methodology offers a higher fidelity. At the same time, this high fidelity can be used to bridge the gap between 2D sketch and conversion to 3D model.

The authors of this abstract combine expertise in design sketching methodology and in computer-aided-design. Since 2017, we have engaged in a multi-disciplinary collaboration to study how designers sketch 3D shapes, and to develop new computer-aided-design tools based on the rules of freehand sketching.

We will present several research projects based on, or inspired by, our collaboration. This includes the collection and analysis of a corpus of 400 design sketches, as well as the development of digital tools to infer 3D shapes from these sketches, to render 3D shapes in the look of design sketches, and to assist students in practicing design sketching.

Besides these outcomes, we will also discuss how our collaboration brought us novel perspectives on our respective fields, resulting in new insights on the practice and teaching and articulation of design sketching, as well as on how design sketches communicate 3D shape.

Motion as key factor in the perception of space

Dominik Lengyel, Catherine Toulouse
BTU University

Spatial perception is only at first glance a question of pure visuality, it is above all a question of movement. It is only through movement, above all that of the observer himself, that an integral of individual sensory impressions forms in the consciousness, creating a mental model of space in the imagination. The body moves through the space, the head makes further movements and finally the eyes look around in order to orientate themselves. Even spatial perception can create depth information on this basis, as objects that are further away appear to move more slowly than those that are closer. Finally, there is stereoscopy, the simultaneous vision from two different points of view, which is further supported by parallax, and focussing of the lens, which differentiates

spatial depths. Only the last two, significantly weaker aspects of spatial vision can be realised directly in a still image, at least with some effort. The composition of the image therefore plays a special role in determining whether images have a spatial effect or not. This applies equally to axonometry and perspective, as neither of these are genuine simulations of human vision. If this is even more obvious in the case of axonometry, but even this approaches human vision as the ratio of distance to size increases, this also applies to perspective, because its static structure requires the main point to be kept fixated in order to correspond to natural vision. The paper aims to explain the essential aspects of compensating for natural spatial vision by means of image composition using examples of virtual models of cultural heritage sites, some preserved, some destroyed, and to use these examples to highlight the special relationship to classical architectural photography and to relevant methods of pre-digital representation in architecture.

Keynote collective II

An Optical View of Delft

Tim Jenison

I spent 6 months on Plein Delftzicht making an experimental re-painting, from life, of Vermeer's View of Delft. My demonstration tested the evidence for two hypotheses. First, that Vermeer used a camera obscura, and second, that he may have additionally used a planar mirror inside the camera obscura to accurately replicate colors on the camera obscura screen. In preparation, I analyzed Vermeer's picture in the context of modern art historical literature, the optical state-of-the-art in 17th century Delft, other Dutch Golden Age cityscapes, period maps, and topographical information relating to the architecture depicted in the painting. I will relate my experience making the painting, and what I learned from the project.

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title

Janne Schimmel

Janne Schimmel examines the significance of user-produced game modifications in shaping gaming's participatory culture. He explores how these modifications serve as spaces for users to negotiate gaming experiences within broader cultural contexts. Schimmel also delves into the cultural and environmental implications of computer hardware and software design choices, questioning their impact on technology, gaming, and the environment. Lastly, he analyzes the myths surrounding modern technology, aiming to reveal the intricate connections between technological innovation, cultural narratives, and societal values.

Posters

Neanderthal Art and the Problem of Ethnocentrism

Tullio Abruzzese
Leiden University

The recognition of artistic expressions coming from the Palaeolithic has always been skewed towards the acknowledgement of our species as the sole superior maker. This is due to the double standard applied to the Palaeolithic archaeological research, for which similar material evidence from Modern Human and Neanderthal contexts are interpreted differently because different levels of cognitive abilities are attached to different human species. This biased understanding of the deep past comes from a Eurocentric mindset derived from the Colonial thought that steered (and regrettably often still steers) Western political, social, and scientific agendas. Colonialism implies the owning and the refusal of knowledge and culture of the Other by the superior Western knowledge system. In this contribution, a review of the state of knowledge and debates around Neanderthal modernity is presented by using Middle and Upper Palaeolithic artistic expressions as a case study. Ultimately, a more relativistic theoretical framework is proposed to move beyond futile discussions around hominins' complexity of thoughts and behaviours. This framework entails the acknowledgement that the quest for the recognition of the 'meaning' behind Palaeolithic artistic expression is an unproductive endeavour that can only favour our species in the race for cognitive complexity. The reconstruction of the meaning of Palaeolithic imagery is not necessary to recognize the existence of a deeper cognitive realm in hominin species. Understanding that our species stands not alone on a higher evolutive step can help archaeology (and also all other sciences involved in the study of the deep past) move forward and beyond its boundaries, by re-evaluating and questioning old interpretations and hypotheses, products of an outdated mindset.

Eyes, Still-Lifes & Eidolons - Effects of Colour and Object information on Eye Movements

Doris I. Braun, Karl R. Gegenfurtner
Giessen University

How important are object colours and contours for the guidance of eye movements? We investigated the influence of colour and contour information on visual exploration of still-life paintings. From the data base of high-quality digital reproductions of paintings from on-line galleries 20 still-lifes of the 17th-18th century were selected (Van Zuijlen et al., 2021). In a dark room painting images appeared on a Display++ monitor in four versions: as original and gray scale image, as Eidolon with colour and as gray scale image (Koenderink et al., 2017). The task was to explore each image for 5 s and to rate after its offset on a 7-point scale the liking. Eye movements were measured with an EyeLink 1000. 26 young participants with normal eye sight and color vision were tested. For each participant and image we analyzed number and amplitude of saccades, position and duration of fixations and the extend of explored image areas (spread). Beside individual differences, eye movement behaviour during visual exploration reflected the content and structure of each image: when objects were defined by contours as in both versions of the originals, significantly more saccades were made, saccade amplitudes and fixation durations were significantly shorter compared to both Eidolons, and the spread was larger. Intersubject predictability was significantly higher when contour information was present; this was significantly further improved by colour. For both Eidolons, object recognition was impaired and fixation durations were prolonged; fixated locations differed when colour information was given. We conclude that contour information results in shorter fixations, smaller saccades, a larger spread and higher intersubject predictability that increases when also colour information is provided.

Illusory colours in monocular rivalry

Leone Burridge

Monocular rivalry describes the phenomenon where one has an alternating visual percept, not due to binocular rivalry, classically in the form of two alternating perpendicular grids or coloured plaids. As a visual artist I have been explored this through iphone drawings then paintings in acrylic on canvas. In a new series of paintings using only two colours and grey, illusory colours appear and the percept alternates as in previously described monocular rivalry. The mechanism can be partly explained by chromatic induction but as the colours fortify or "light up" with sustained gaze there may be another unexplained mechanism involved.

Artworks - flat packed lunch

Eve Cromwell

Hello, I'm evelyn cromwell and I'm an artist living in the north-east of england where I have a studio in the newbridge project. After completing a degree in glass and ceramics in 2017, I now enjoy making functional sculpture and experimenting with various materials, with a particular focus on wood and plastic.

Most of my inspiration comes from everyday objects and things that might be seen as mundane and just a part of life. I like to choose an object and use it as a lens to see the world through. Looking at things that are ubiquitous and questioning how they became that way. Along the way, that might mean drawing lines between things that at first might not seem linked. I'm interested in how society shapes, is shaped by, and reflected in specific objects, and I seek to answer questions like: what is this thing? Why is it like that? What would change if it were to change?

To create my work, I embrace the constraints that design offers. For example, a chair has to be sat on. I start with the piece's function and my chosen subject as the constraints, and play with the material and context to add layers of meaning to it. Material and texture are my big loves, so I also see my studio as a lab where I can expand on my material knowledge and experiment.

Reconstructing Maarten van Heemskerck's flesh paint

Lieve d'Hont

University of Amsterdam

Around 1555, Maarten van Heemskerck painted Christ Crowned with Thorns, which is preserved and currently undergoing a conservation treatment in the Frans Hals Museum in Haarlem. Despite the considerably damaged state of the painting, Christ's body stands out lifelike and monumental. His pale, silently suffering body is contrasted to the darker skinned, moving soldiers inflicting his pain. This paper explores how making a historically informed painted reconstruction helps our understanding of the way Heemskerck convincingly painted flesh in this picture. The first step towards reconstructing is to "deconstruct" the original painting through visual, technical and scientific analysis. For we need first to answer the question "What makes Heemskerck's flesh paint convincing?". The ways Heemskerck represented three-dimensionality and specific qualities of skin, such as a degree of translucency, are explored. Special emphasis is dedicated to possible physical relationships between the depicted material (skin, flesh and body) and the physical painting (pigments, paint layering and surface texture). This leads to a hypothesis about the painting technique. Finally, by painting a historically informed reconstruction this hypothesis is tested. The reconstruction's aim is to further our understanding of the painting process and the visual and optical effects that are used, not to perfectly copying the original painting. At what point in the painting process did the material turn into a convincing representation? It is this hands-on performative approach of choosing materials (e.g. pigments, pigment-binder ratio), methods (in particular layering and the organisation of work) and movements (the application of the paint and the use of

tools), that provides valuable insights in the way we perceive the painted object and the represented subject.

Rethinking Realism: an interdisciplinary exploration of Upper Palaeolithic Venus Figurines through eye-tracking methodologies

Sam Hirst, Paul Pettitt, Robert Kentridge
Durham University

The European Upper Palaeolithic (40,000 - 11,500 years Before Present) witnessed a remarkable surge in artistic expression, notably marked by the advent of figurative art. Small, 3D female carvings ('Venus Figurines'), common from western Europe to Russia between 31,000 and 23,000 years Before Present, represent the earliest traditions in the depiction of human beings.

Characterized by a collective abstraction of the female form, Venus Figurines have elicited a myriad of theories. Traditional interpretations often revolve around their association with fertility symbols, Mother Goddess cults, and celebrations of womanhood. Despite these prevailing ideas, archaeologists still debate whether these artifacts truly represent realistic depictions of women. However, until now, the degree of realism within the Venus Figurine corpus has eluded quantitative assessment.

This study employs an innovative interdisciplinary approach by integrating eye-tracking methodologies with archaeological analysis to delve into the intricacies of visual interaction with Venus Figurines. Through gaze data analyses and a comparative examination of the perception of female imagery, our study aims to elucidate the true nature of Upper Palaeolithic female representations.

Our findings suggest that the overemphasis on sexual characteristics in these figurines may not accentuate their womanhood but, rather intriguingly, inhibit their recognition as authentic female bodies. Challenging interpretations of Palaeolithic artists' pursuit of realism, positing that these figurines may have functioned more as symbols of femininity rather than accurate depictions of specific individuals.

This study prompts a re-evaluation of the artistic intentions of Palaeolithic artists, and raises a fundamental question: when does a depiction cease to be a mere representation and transform into a symbol? By shedding light on the symbolic nature of Venus Figurines, our research contributes to a deeper understanding of Upper Palaeolithic art and contributes to broader discussions on the blurred boundaries between depiction and symbolism in prehistoric cultures.

Exploring infinite spaces from finite confinements

Scott Jochems, Joris Rijsdijk, Ravi Snellenberg, Rafael Bidarra, Martin Skrodzki
Delft University of Technology

Virtual and augmented reality (VR/AR) have been increasingly popular in recent times. These experiences open up countless possibilities when it comes to perceiving and interacting with unfamiliar environments, such as hyperbolic spaces. We present an application that utilises these new possibilities, a project called Holonomy. Using a VR-headset, people playing Holonomy are able to explore a non-Euclidean hyperbolic world. More accurately, Holonomy is made up of a 3x3 grid of euclidean square rooms that are connected using a hyperbolic order 5 square tiling. This grid matches up with a 3x3 metre perimeter in the real world. By physically walking specific paths, players are able to make new parts of the virtual world accessible. Thanks to this property, it is possible to stay in a finite physical space and explore an infinite hyperbolic world in VR without techniques such as virtual teleportation or walking using a joystick. Furthermore, Holonomy serves as a platform to consider questions on navigation and perception. For instance: How capable are people at navigating this unfamiliarly behaving environment? How could this environment be adapted to help the players navigate it? And how could existing algorithms such as shortest path calculation be adapted to work in this new environment? Overall, the project challenges users to question their own perception of space. They are constantly confronted with the discrepancy of their physical reality that might have completed a circular path, while their virtual reality that has not yet reached the point of origin of the movement. Thus, the project decouples different levels of perception and prompts the user to re-evaluate their own navigation, meaning of place, and their mental image of space.

Mapping visual attention to important and unimportant details in art photographs and paintings

Maarten Leemans, Johan Wagemans
KU Leuven

When inspecting an artwork, one is often struck by details that prompt further exploration. Details often convey an iconographically important role and are often carefully placed by the artist to balance the composition of an artwork. Moreover, noticing a detail can sometimes drastically alter the aesthetic appreciation of the full artwork. We therefore start from a broad notion of "details" as all possible image inhomogeneities, that can differ widely in terms of size and importance, and in the impact they can have on the perception and appreciation of an artwork. In the present study, we explore the effects of viewing such details on the appreciation of the full image. In the first experiment, we validated a theoretically informed stimulus set by asking participants to indicate which image regions they consider important for appreciating the image as a whole. Based on this validation, we selected 200 stimuli, balanced between paintings and artistic photographs. In a second experiment, we will systematically map the appreciation of details across the whole image by applying a newly developed aesthetic

map technique. To generate aesthetic maps, we will borrow from, and go beyond, the meaning map approach applied in scene perception. Specifically, we will decompose the image into square-shaped local image patches, which are then rated by a large pool of participants on appreciation and importance. After a series of pooling, averaging, and smoothing stages, these ratings yield the spatial distribution of the local aesthetic density ratings of that image. In the third experiment, we will record eye-movements to examine how viewers allocate visual attention to these validated images, to elucidate the relation between visual attention to local image regions and aesthetic appreciation of the whole image.

A love letter and its secret author. Vermeer's "Girl reading a letter at an open window" as a thought-vision of the viewer

Martin Lottermoser

TU Dresden

Everyone knows Vermeer's painting "Girl Reading a Letter at an Open Window", but no one knows the letter's author. Since the restoration and following exhibition in Dresden in 2021, it has been clear what it is all about: It is a love letter. After an overpainting was removed, the god of love Cupid appeared as a "picture within a picture". While the painting's history may thus be considered to have been clarified and attention drawn to other questions such as exhibition practice, neither the visual rhetoric nor the associated problems of pictorial narrative have been sufficiently addressed. Vermeer's paintings stage encounters. The artwork and its viewer are like the letter to the addressee: there is always a secret to be revealed. Vermeer's figures sometimes lift their eyes and look out of the picture - as if something beyond the frame has awakened their interest. We are repeatedly assigned the role of a distracting guest, even a voyeur. In the "Letter Reader" the girl believes she can read secretly, alone and undisturbed, but we watch her without any problems. But why? And who wrote the ominous letter? The paper would like to offer a new interpretation by taking an iconographic and reception-orientated approach and attempting to do justice to Vermeer's staged role play and to ask about the viewer's role in front of the painting. If we take both the viewer's role as an undiscovered voyeur enforced by the painting and the illusionistically painted curtain in front of the painting seriously, the seemingly real depiction in the context of the narrative dissolves into a mental vision of the beholder in front of the painting. It is clear that Vermeer's composition has not only considered the pictorial space, but also the real space.

Lifelike Butterflies Painted with Oil and Colourful Dust

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University of Konstanz

During the mid-17th century, the Dutch painter Otto Marseus van Schrieck travelled to Italy where he developed a category of painting that was unusual for that period: the sottobosco paintings representing plants and animals, such as insects, amphibians, and reptiles, in dark forests. To paint butterflies, instead of painting their wings, Marseus used lepidochromy, which consists in transferring the colourful scales of real insects by pressing their wings onto the painting surface. The fragility of the butterfly materials requires specific conservation care to prevent their colours to bleach. The colours of scales transferred in oil paintings exposed to light disappeared. Therefore, the original materiality of the butterfly imprints in Marseus' artworks are forever lost and their visual effects as perceived by early modern viewers have been dramatically altered. Yet, Marseus was renowned for painting with a high reality effect the animals he was able to observe first-hand in nature and in his vivarium, where he kept living specimens. He was likely able to paint butterflies, especially because representing these animals accurately was part of the education of Dutch still-life painters. Remaking the lepidochromy technique allowed us to reconstruct the original intended visual effects, which appeared to have different optical and visual properties. The original scales look like dust and provide the image of butterflies with a strong haptic texture. This contribution will compare the visual effects of the texture of lifelike painted butterflies and those represented through lepidochromy. It will consider 17th-century painting theories to elaborate on the perception of these various techniques to represent butterflies with a high reality effect.

Picture-surface, picture-subject: an empirical assessment of Wollheim´s theory of Twofoldness

Anna Miscena, Jozsef Arato, Raphael Rosenberg
University of Vienna

Richard Wollheim's theory of art perception makes use of a supposedly innate human ability, Seeing-in. Seeing-in pertains specifically to the visual perception of paintings, enabling viewers to simultaneously perceive both a picture's subject matter and its surface qualities. Although a beholder may selectively focus on one at the expense of the other, ignoring either aspect completely appears to be impossible.

Twofoldness - as it came to be described - can be traced back in art theory to at least the nineteenth century. Although most of the theoretical discourse regards it as a purely phenomenological occurrence linked to a subjective awareness of semiotics, Wollheim suggests it is biologically grounded and observable in human behaviour from infancy, which calls for empirical investigation.

How does the perception of a painted surface, in regards to its texture, colour value, brightness and more, differ in observable behaviour from that of a profile, a house or a landscape? If there is no distinction, what characterises the visual experience of painting as twofold? And if there indeed is a difference, is a simultaneous, though distinguished, perception of picture-surface and picture-subject possible?

To address these questions, we conducted an eye-tracking experiment with high-quality reproductions of paintings displayed in a laboratory setting. The paper presents the findings of this study, the design of which was informed by Wollheim´s theory as well as existing eye-tracking research on the perception of low-level and high-level features in complex visual stimuli.

Presentation of artworks

Jenny Mc Namara

My studio work is experimentation between surface, space and colour and I use a range of media including sculpture, print, painting and LED light. In particular, I explore emotional responses to colour and pattern. I'm especially interested in the possibility of using pattern as a tool for mindfulness in all these ways: making patterns, finding them and looking at them.

I use patterns in my work because they are a good tool for capturing and holding visual attention (the eye is naturally drawn to salient areas that contain the most detail) Noticing patterns allows the mind to rest and be in the present, to rely on incoming sensory data and not worry about the past or the future for a moment.

I see my sculptures as 'pattern machines'. They are often made using lights and reflective materials or lenses that disrupt patterns and make new ones. As the viewer interacts with the sculptural works and moves around them, the distorted patterns in the mirrored surface change depending on their viewing position. I sometimes explore the newly created patterns further by bringing them back into 2D through photography, print and painting.

I'm influenced by the Minimalist art movement, which marked a shift in art from the object to viewer experience. In minimalist artworks, there are just a few visual elements in play. They might start with one visual element, like colour, and bring in just one or two more, like shape and line. To me, this visual reduction makes me feel more focused and relaxed. I'm a fan of abstraction because it allows the viewer to use their imagination to make sense of the image.

You can see more images of work here: jennymcnamara.com

Hue-Specific Effects of Lighting on Perceived Atmosphere

Giulio Palma, Kelley Nicholas, Graf Erich W., Witzel Christoph
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Architects, artists and designers use coloured lighting to shape the atmosphere of a scene or artwork. In this study, we investigated whether the hue of the lighting reflects specific emotional aspects of perceived atmosphere and whether these effects are independent of the content of a scene or image. We developed a new task in which observers were shown the same scene under five different lighting colours (neutral white, reddish, yellowish, greenish, and bluish). They picked the coloured scene that best matched one of 15 atmospheric descriptors. The 15 atmospheric descriptors extended those known from the literature to cover positive and negative emotions at high and low arousal and included: cosy, calm, relaxed, lively, stimulating, energetic, threatening, hostile, scary, lonely, gloomy, depressing, formal, professional, and boring. We measured those atmospheric matches for different interior and outdoor scenes in two independent online studies (N = 268; N = 227). Results were highly correlated across the two online studies (r = .80, p ¡ .001) showing that colour choices were systematic across observers and independent of scene content. We used the similarities of colour choices to map out all 15 atmospheric descriptors for each of the 10 scenes from both studies along two dimensions. This colour-based map ordered descriptors by their valence (cosy, lively etc vs depressing, boring etc.) along a warm-cool colour dimension, and according to negative arousal (boring vs gloomy, scary) along a neutral vs green colour dimension. Different computational methods (principal components analysis, metric and nonmetric multidimensional scaling) produced very similar mappings. Our colour-based map allows for precise manipulations of perceived atmosphere through coloured lighting, for example in photography, lighting design, and architecture. Ongoing studies examine whether these results can be transferred to figurative and abstract paintings.

A Watermark Recognition System: an Approach to Matching Similar Watermarks

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Watermarks are historical motifs present in the texture of paper that are commonly used to identify the paper manufacturers. They only become visible when viewed under certain light conditions. Under ideal circumstances, researchers may use watermarks to determine a historical document's origins and context. To identify a watermark, it is matched to a previously archived watermark. Currently, this matching must be done manually, which is neither scalable nor parallelizable. Existing studies explore digital reconstructions of watermarks, but do not focus on a comparison-based setup. This report discusses a system that can automatically identify similar watermarks using traditional image processing techniques. The resulting system speeds up the process considerably, can be used on small datasets, and is more accessible to end-users. The system uses

harmonization, feature extraction, and similarity matching. Harmonization involves improving the clarity of the watermark, which is often obscured by the material properties of the paper. Feature extraction involves finding useful information from isolated watermarks, and similarity matching uses this information to score the similarity of a pair. We evaluated our system based on a dataset provided by the German Museum of Books and Writing. Over a broader range of quality, accuracy was found to be within the range of 41-53%. It was also found that improving watermark quality within the dataset improved accuracy results to around 82%. The system shows promise, particularly with higher-quality datasets. This report therefore demonstrates that traditional image processing techniques can be valuable when applied to situations where artificial intelligence may not be possible or efficient. Further research into this domain would be required to understand the advantages and limitations of image processing in comparison with artificial intelligence.

Image Complexity vs Aesthetic Appreciation in Abstract Art

Maartje Raijmakers, Eftychia Stamkou, Laura 't Groot
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In aesthetics research on visual art, a central question concerns how artwork complexity influences viewer aesthetic appreciation. This study empirically tests the Goldilocks principle (Berlyne, 1971; Cutting, 2020), which posits that optimal complexity leads to peak aesthetic appreciation. Three important questions were raised in this study: "What is complexity of the artwork?", "What is aesthetic appreciation?", and "Which viewer's individual differences moderate this relationship?". Participants (N = 51) engaged in self-paced viewing of 50 abstract artworks, with a minimum viewing time of 7 seconds per artwork, while their eye movements were recorded. Subsequently, participants provided judgements of each individual artwork. We operationalized complexity using traditional self-reports of perceived complexity but contrasted it with two algorithmic measures: JPEG- and fractal-complexity of the painting (Forsythe et al., 2011). These measures showed strong correlations (fractal vs JPEG, r=.77; JPEG vs self-report, r=.81; fractal vs self-report, r=.75), supporting their validity and replicating two previous pilot studies. We operationalized aesthetic appreciation of an artwork as a multifaceted construct (Gartus et al., 2015), evaluated through self-report beauty, self-report interestingness, and viewing duration for each artwork (beauty vs interestingness, r=.55; beauty vs viewing duration, ns; interestingness vs viewing duration, r=.36). In most mixed-effect models with random intercepts predicting aesthetic appreciation, the quadratic terms of complexity are significant, affirming the hypothesis that an optimal level of complexity predicts aesthetic appreciation. Predicting self-report interest from JPEG complexity shows the best evidence for the Goldilocks principle. We discuss results in relation to eye-tracking scan paths.

Assessing material appearance based on image color entropy

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The University of Tokyo

Materials in our daily lives undergo diverse color changes based on environmental contexts. For instance, water is inherently colorless, but wetting a surface changes the colors of the surface. Previous studies have explored the effect of colors on material perception while following the literature on object recognition, i.e., examining the effect of categorical colors on a grayscale image. However, unlike object recognition, categorical colors are not always diagnostic for material changes due to context dependence. To address the issue, this study explores color dimensions diagnostic to material perception. Building on recent studies showing that material perception depends on image color entropy (Sawayama et al., 2017), the author investigated the extent to which modulating the image color entropy, defined by the color quantization of an image, affects the material predictability. Specifically, they employed a zero-shot prediction paradigm using pretrained vision and language machine-learning models (e.g., CLIP) to assess the effect of colors on material perception. They used 2AFC text prompts related to material perception, such as wet/dry or glossy/matte. The THINGS image dataset is chosen for the experiments. For color modulation, color quantization is applied through the median cut to each image, reducing the quantized number to two. Additionally, grayscale images are created from the original RGB images. Results of the experiments showed that the distribution of prediction probabilities was diversely distributed for original and grayscale images across all dataset images. However, when an original image was modulated by color quantization, the distribution diversity diminishes, heavily biasing towards specific attributes, particularly dry, matte, and opaque. Further experiments confirm that these color modulations minimally impact zero-shot object recognition performance compared to material tasks. These findings suggest that diverse material perceptions of an image are achievable with high color entropy, as defined by color quantization.

What words do we use to describe colour-changing (iridescent) surfaces?

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Iridescence is often described as the perceptual experience of surface-colour changing with viewing angle. Whilst our understanding of the perception of iridescence remains obscure, material properties that give rise to iridescence can be objectively characterised and defined. For example, when iridescence arises from interference in thin-film coatings, the thickness of the coating can be systematically manipulated. However, our subjective perception of material appearance often does not correspond neatly to objective boundaries.

We report a free-naming study that used objects with a beetle-like depiction, rendered with five surface coatings (metallic and four thin-film thicknesses) and two microscale textures (rough and smooth). The stimuli were shown in four lighting environments

that differed in spatial structure, spectral uniformity, and diffuseness. The resultant stimuli differed in image statistics between the five surface coatings, but also across environments and textures. Participants viewed videos of the objects rotating around the horizontal and vertical axes. Videos were presented on a bespoke high-dynamic range (HDR) display capable of reproducing the broad range of intensities often displayed by real iridescent objects.

For each video, participants were asked to provide a list of words or short phrases to describe the material and appearance of the objects. Descriptors were aggregated across all participants (N=10) and Bray-Curtis dissimilarity scores were calculated between pairs of stimuli based on the top 10 descriptors and their corresponding frequencies. We found a significant effect of environment on the descriptor-based dissimilarities and a significant interaction between environment and texture. The results support our expectation that in contexts where image chromaticity distributions are more similar, the stimuli are more likely to be described using similar words. We discuss our findings, the implications for perception of iridescence that is robust to contextual factors, and future directions for research.

3D printing the Mixtec skull: The opportunities and challenges technology provides in discussing ethical issues surrounding contested heritage in a co-creative, inclusive, and responsible way.

Liselore N.M. Tissen

CLARIAH KNAW, TU Delft, Leiden University

The discussion about the repatriation and restitution of stolen or looted artifacts such as, the Mesoamerican (Oaxaca, Mexico, 15th century) human skull covered with mosaic part of the Volkenkunde museum in Leiden, has been a growing topic of interest within the humanities and museums. Museums are often hesitant when it comes to the restitution of their objects because returning them might mean losing a precious and important object of the collection. However, for communities of origin, it means the return of a piece of their culture. Unfortunately, this oftentimes results in an uneven conversation as the communities of origin are oftentimes not consulted within the decision-making process. Yet, recent developments in the digital and technological field, 3D printing specifically, have made it possible to create almost identical copies of any artifact meaning that it can be disclosed unlimitedly and shown in a variety of ways; hence igniting new ways of interpreting and engaging with original artifacts. Taking the Mixtec skull as a case study, this research aims to explore the possibilities, dangers and ethical considerations to be made when using 3D technologies to negotiate issues surrounding contested heritage in a co-creative and inclusive way. The research, methods, and results will be used as a first example of using digital humanities methods to explore co-creation with museums, communities of origin, and researchers. The research is based on interactive sessions held in Oaxaca with the community of origin using 3D reproduction, experiences gained during an expert meeting in the Netherlands consisting of an interdisciplinary team (researchers, curators, museum directors) and members of the Mixtec community, and, lastly, on panel discussions with the general audience. That way, the aim is to discuss

how these 3D models can help communicate about these delicate topics in an engaging, inclusive, and understandable way.

The influence of the variations in daylight on the perception of colour

Catherine Toulouse[1], Dominik Lengyel[1,2]
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Colour is a perceptual phenomenon that arises from the superimposition of the colours of light and its reflecting surfaces. The perceived colours of the surfaces are therefore illusory and variable. Claude Monet's studies of haystacks and Rouen Cathedral have made this phenomenon abundantly clear. On this basis, the authors have investigated the extent to which the colours of the environment, and specifically just the different natural light colours depending on the weather and time of day, have an effect on architecture. The questions examine the influence on virtual architecture, which often has to decide in favour of or against polychromy in the conflicting area between photorealism and scientificity. Without question, the influence of polychromy on the perception of architecture is considerable. In polychromatic representations, as Winckelmann's often misunderstood argument goes, the perception of polychromy dominates and overrides that of geometry. The fact that this is the case has less to do with a supposed underestimation of polychromy than with the fact that the amount of information simply increases with the addition of polychromy. Particularly in the area of scientifically visualised archaeological hypotheses the certainty with regard to geometry is significantly higher and can therefore convey considerably more information directly. The study presented here, based on ancient hypothetically reconstructed rooms, demonstrates that the variability of the colourfulness of the ambient light alone can model the perception of the room, even if the surfaces themselves are white. The extent to which this applies to polychrome rooms is shown by a study carried out on the occasion of the purchase of a collection by the Bauhaus Archive Berlin, which confronts polychrome interior designs, which are drawn up in unfolded form, as virtual spatial models with daylight, so that the colours enter into a relationship with each other for the first time.

The Picture Stares Back

Andrea J. van Doorn, Jan J. Koenderink
KU Leuven

Although we are aware to be headless (whereas other people are seen to have heads) we feel to experience the world from some perspective. It is generic vision. Euclid explained it by a concurrent sheaf of visual rays, the apex of which is "me." Alberti represented this sheaf by a planar pattern. Looking at such a pattern is "pictorial vision." Pictorial vision is ontologically distinct from generic vision. Ignoring ontology, scientists explain pictorial vision as a restricted kind of generic vision. This attempt is abortive, so mismatches are termed "illusions" and interpreted as mental quirks. Artists succeed to overcome such misunderstandings, but their accounts are ignored by scientists. An interesting example is a manifest by the constructivist El Lissitzky. In his account of pictorial vision the eye and the principal vanishing point change places. The Euclidian sheaf of visual rays diverging from the vantage point calls forth a pencil of mutually parallel mental rays looking in the opposite direction. The "mental eye" which is "there" (at infinity) stares back at the eye of the observer, which is "here" (coincident with "me")! Alberti's window acts as the mediator. Although Lissitzky's account is hardly scientific ("mystical" perhaps), it is not hard to frame it in formal, geometric terms. This should be augmented with an interpretation of the ontology. A projective transformation maps the physical world (scene) on the mental world (image triggered by a picture). Moreover, the mental rays are interpreted as isotropic, so the mental (deep!) space neatly fits in the (flat) pictorial surface. The model accounts for various "illusions" and neatly fits accounts of artistic pictorial design.

Does Camera Movement Move Us, or: How embodied is Film Viewing?

Lisa-Maria van Klaveren, Steven Willemsen
University of Groningen

There has been a long-standing tradition of claims that cinematic camera movements derive their effects from mimicking human bodily sensations and movement. For instance, Arnheim (1957) argued that "feelings of giddiness, vertigo, intoxication, falling, rising - all these are easily produced by the appropriate motions of the camera". So far, scholars have proposed to understand the connection between camera movement and spectators' embodied resonances through phenomenological correspondences of film style to lived embodied experience (Sobchack, 1991), metaphorical relations between film style and embodied image schemas (e.g. Coëgnarts 2022) and, recently, the role of mirror neurons in activating viewers' sensory-motor and visceral-motor neural representations in observations of human(like) actions (Gallese, Guerra & Anderson 2019).

While the latter approaches assume cinematic embodiment to happen via brain-based simulations, this pilot study investigates whether traces of embodied reception of camera movement can also be found in the actual body. To that end, 16 participants watched 21 film clips (35-40 seconds) while standing on a Wii Balance Board. The clips were selected

based on camera movement with four clips in each of the following categories: static, panning and/or tilting, steady-cam tracking, and hand-held tracking. The clips were further balanced for on-screen character movement as low (e.g., sitting) or high (e.g., walking), and for presence of sound and music. After each clip participants answered a short questionnaire on their feelings, bodily sensations and engagement during viewing. During the clips, postural sway was tracked as a measure for perceptual attunement of the body to its environment (e.g., Ramenzoni, Riley, Shockley & Chiu, 2007). In this poster, we will present preliminary results on differences between types of camera movement and viewers' affective, behavioral, bodily and narrative responses, exploring the bodily effects of the camera as a medium.

Cast shadows enhance pictorial depth perception of volumetric shapes

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Cast shadows are formed whenever an object occludes another object or surface from the source of light. While often overlooked as mere consequences of specific lighting conditions, cast shadows themselves play a central role in the realm of visual perception and contribute to the understanding of the spatial arrangement of objects in space (i.e., the object position relative to the surface it casts the shadow on). The crucial role of cast shadows as sources of spatial context is evident above all in the field of pictorial art, as they have been widely studied since antiquity in attempts to render depth and realism in the represented scenes. It is, however, less clear if cast shadows influence the ability to judge the 3D shape of depicted objects. Here, we wanted to explicitly test the hypothesis that human shape perception is influenced by the presence of cast shadows in pictorial representations of volumetric shapes. The first aim of the study focused on whether the presence or absence of cast shadows generates different interpretations of objects' depth. The second aim focused on the effect of prior knowledge on the perception of three-dimensionality of objects in the presence or absence of cast shadows. To quantify the perceived 3D surface structure of objects we used a gauge figure task on a set of images depicting five objects with various degrees of 3D shape complexity and familiarity, represented with or without their cast shadow. Importantly, all the other pictorial characteristics of each object (shading, attached shadows, inter-reflections) were kept intact. Our findings suggest that the mere presence of cast shadows leads to a consistent increase in the perceived depth of volumetric pictorial shapes. Moreover, the presence of cast shadows has larger effects on depth the scarcer the prior knowledge is about the depicted shape.

Image-Works: An Exhibition Study Focused on the Interactions between the Medium of Depiction and (Re-)Presentation in Vision

Johan Wagemans
KU Leuven

Artists and art theorists often emphasize the role of materiality of artworks but the broader public more frequently encounters digital images of them (online collections, social media). We designed a quasi-experimental, field study to compare the two conditions more directly. Specifically, we organized an exhibition in an old chapel in Leuven, with 4 artworks by each of 3 visual artists (Patrick Ceyssens, Stefan Peters, Eline Wagemans). This exhibition was titled "Image-Works" because all the artworks display rather complex, multilayered images that require substantial work from the viewer to be appreciated. In addition to 9 stations with different arrangements of the physical artworks in the exhibition proper, we also designed a parallel computer experiment showing high-resolution photos or scans of all the images of the 12 artworks on a large LCD screen, either presented at fixed sizes or with a zoom in-and-out option. All participants viewed both versions (physical and digital) in counterbalanced order, with a video-interview in-between the two sessions, in which the artists explained their way of working, the materials they used, the role of space, composition, color, light, texture, size, viewer engagement, etc. Moreover, we imposed various trajectories through the exhibition, visiting the stations in different sequences; some with free viewing, others with constrained viewing; some with additional visual literacy manipulations, others without. Perception and appreciation were investigated in all these conditions through mobile eye-tracking, rating scales, and questionnaires (total N = 86). I will present the initial findings, focusing on the differences in the eye-movement data between the conditions with the physical artworks and the digital images, in relation to the appreciation data. I will also discuss the impact of the video-interview as a source of additional context information. Conclusions will be formulated as interactions between the medium of depiction and aspects of (re-)presentation in vision.

Learning variable shape footprints from brushstroke models

Yu-chen Wu, Peter M. Hall
University of Bath

Computer emulation of the way in which artists make pictures using strokes has been researched for around two decades. Three distinct problems are apparent: what strokes are made of in terms of media, how to make strokes in terms of hand action, and where to place strokes to ensure artistic expression. Early work was prescriptive (no learning) and has met with great success, with media emulations appearing in interactive paintbox tools, for example. Recent work is able to learn, but tends to emphasise texture transfer rather than stoke making. Learning how strokes and made and where to place them for automatic picture-making remain open problems.

We address both of these issue. In contrast with all current literature we show that the "how" of strokes in general cannot be modelled via a single sweep using an

applicator with a circular footprint: using examples from artists we learn to make strokes using elliptical applicators. To address the "where" problem we argue that placement is an issue of semantics, and therefore appeal to modern language models. We will show examples using Matisse, sketches, and Chinese calligraphy.

Painterly Style Transfer with Learned Brush Strokes

Xiaochang Liu, Yu-chen Wu, Peter M. Hall
University of Bath

Brush strokes are a basic rendering primitive used by artists to depict semantic content. Neural Style Transfer (NST) is a popular technique that aims to render an input photograph in the same style as a given exemplar artwork. The bulk of NST does this by transferring texture; it does not use strokes so the output does not look "painterly". Further, the texture is transferred without reference to semantic content, further reducing output quality. We describe a novel method for stroke-based style transfer. Our main con- tributions are: (i) we learn "stroke families" from the exemplar, and (ii) we place new strokes in a new image using a language model.

Our strokes families analysis learns the distributions of stroke shapes (a dot, straight lines, curved arcs, etc.) from the exemplar, differentiating between Seurat, Picasso, and van Gough. For picture synthesis, we sample new strokes from a distributions to guarantee the stroke style consistency with the style exemplar. Thus, our model produce more "painterly" output than NST output based on texture features alignment.

Strokes alone are not enough. Artists place strokes to emphasize salient semantically meaningful objects out from others in scene. We call this "dif- ferentrial rendering". Convolutional NST, which premised on filter responses, is agnostic to salience. In contrast, we employ a language-image contrastive learning model to measure the semantic loss, enabling us to emphasise salient content.

Materials and materiality

Solid and fleeting depicting material stories in a materials collection

Sarah Kaiser, Andi Wagner
Burg Giebichenstein Kunsthochschule Halle

Our contribution shows how narrative layers of materials are collected, displayed and communicated in the materials collection at Burg Giebichenstein University of Art and Design Halle (BURG). By using various formats, media, samples and objects in the collection, it will be shown what contemporary materials education can look like.

Material is present everywhere - as material of construction, means of expression and medium, but also as an image carrier and motif. Giving things a form, it also tells of the contexts and symbolic levels of meaning in which it stands and can thus become the main protagonist. The work with different materials has a long tradition at the BURG. The material collection extends the existing places of material education at the BURG, such as studios and workshops, by adding a space of the complex world of materiality, that is systematically represented by various patterns. Wood, metal, paper, plastic, glass, ceramics, textile fibers and fabrics, mineral, plant and animal materials are collected and displayed in all their diversity and particularity. Students are invited to discover, compare and examine materials with all their senses. The samples are linked to the Material Archive's online database so that background information on each material can be accessed, e.g. on properties, processing options, cultural history, economy or ecology. In the material collection, however, material is not only understood as a resource that can be further processed, but also as a carrier of meanings and as an active component of artistic practice. The collected materials are not only questioned for their functional use or aesthetic value, but also for their narrative content. Each material stands in complex contexts to which it refers and which, together with the material properties and personal references of the users, shape the narrative dimensions of a material.

Free Exploration of Materiality and Space Across Three Contemporary Art Exhibitions

Christopher Linden, Stefanie De Winter, Johan Wagemans
KU Leuven

Museums provide unique opportunities for visitors to engage with the material features of artworks, and different materials may elicit different approaches to viewing. Visitors can get closer to or further from various works, view them from different angles, and engage with their depth and texture — all of which are explorative behaviours that would be difficult to emulate in a non-physical medium. When viewing artworks in a museum or gallery, the physical layout of the space also provides particular affordances that can guide visitors' navigation from artwork to artwork, in addition to the material-specific affordances of the artworks themselves. Over a series of three free-exploration mobile eye-tracking (MET) studies in museums and galleries in Belgium and the Netherlands, we have assessed the relative contribution of these factors on participants museum exploration behaviours, and their subsequent appraisals of the artworks on display. The

first study (n = 103) featured comparisons of fluorescent paintings and printed copies of two Frank Stella artworks. The second (n = 112) focussed on a Pieter Vermeersch exhibition, featuring painted marble slabs and architectural installations. The third (n = 104) explored a gallery featuring a group of contemporary artists (Hanne De Corte, Muesli Collective, Griet Moors, and Stefanie De Winter), whose works all play with the materiality of the artworks. We applied TaMuNaBe, our recent taxonomy of museum navigation behaviours, to the MET videos of each study in order to classify the explorative behaviours of the participants in each gallery space. We used hierarchical clustering models on the frequencies of these behaviours to determine common exploration patterns within and across studies. Some clusters clearly link to engagements with the materiality of the artworks (distance shifting, angle viewing) and installation elements (exploratory walks), and these tended to be predictive of visitors appraisals of the artworks and exhibitions.

Pieter Bruegel's Blind Figures, Visuality and the Human Position

Hannah De Corte
Univeristé Libre de Bruxelles

For Vision and Depiction, I propose to present my forthcoming book on Pieter Bruegel's "Blind leading the blind" (1568) (ASP Editions, February 2024), by doing a close reading of the painting, a Ťüchleinťempera on linen in which Bruegel used the canvas's materiality in a radical manner. A fundamental painting in early modern portraiture, the Blind leading the blind embodies essential shifts in thinking and seeing. To show this, I will describe the unusual techniques with which Bruegel installed a discontinuity between figure and ground, thus between man and nature, inside the painting. The picture presents crucial differences which have not been addressed, between the facture of the brightly lit figures and that of the blurry and stained landscape. Using a (chalk glue) preparation solely underneath the blind men, Bruegel physically painted the human figure on an elevated pictorial plane, distinct from the natural environment and its textured, absorbent, linen ground, where he fully utilized the qualities of the unprimed fabric. Bruegel's deeply humanist gesture echoes the emerging political and philosophical ideas of the early modern period that put man above nature and removed from it (in a cosmology known as naturalism) - a displacement that shaped Western society. The interruption by the white preparation of Bruegel's linen underneath the figures in one of his last two paintings, reflects an interruption in the fabric of life and - just like other paintings by Bruegel - a shift from the late Middle Ages to the humanist mind.

Material Experience Framework in Cultural Heritage

Willemijn Elkhuizen
Delft University of Technology

To make sense of a cultural heritage (CH) artefacts, we can analyze them through various lenses, by for instance focusing on the pictorial/textual content, the medium, and/or the (historical) context. In the design of a cultural heritage experience, stakeholders make choices which and how such insights get represented, and how they relate to the interactions users have with or through a (digital) medium. These choices - and its effects on the overall experience - often remain underlit, specifically on the role of an artifact's material experience. Therefore, I propose an approach to analyze the material experience of a CH artefacts, on the sensorial (i.e., how people sense materials), interpretive (i.e., meanings evoked by materials), affective (i.e., emotions elicited by materials), and performative (i.e., actions elicited by materials) level (Giaccardi and Karana, 2015). This characterization is exemplified with a case study on (historical) pop-up and movable books. I also present two extended reality prototypes, designed to explore how this material characterization - clustered into material qualities - could be used to inspire novel interactions, with aim to enhance 1) the material experience of, and 2) the narrative engagement with a pop-up and movable book. Reflecting on this design exercise, I argue that we need to apend existing frameworks and tools, to support designers in 'choreographing' – and evaluating - experiences across different experiential levels and analytical lenses. As a starting point, I propose a preliminary framework, supporting designers to articulate the role of materiality in the to-be-designed (digital) experience. Finally, I argue that the focus on an artefact's material experience can open up avenues to operationalizing the concept of "experiential authenticity" (Penrose, 2020), moving beyond striving to be 'as-realistic-as-possible'.

Tintoretto's Texture: An Experiment in Non-Contact 3D Laser Scanning

Cleo Nisse
University of Groningen

Jacopo Tintoretto's Creation of the Animals, 1551, provides eloquent testimony of the radical experimentation that Venetian Renaissance painters undertook into the textural potential of oil paint on canvas. It is on a support constructed from different kinds of fabric—some of fine, plain-weave linen, some with a diagonal weave pattern—patchworked together, which the artist then worked over with thin washes of paint so that the grain of the substrate transmits to the surface, before tactically punctuating it with occasional brushstrokes of thick impasto. My presentation draws from a pilot project recording the surface of this painting with the Lucida 3D laser scanner, carried out with Factum Foundation for Digital Technology in Preservation and the Gallerie dell'Accademia, Venezia, to explore the possibilities (and limitations) this tool offers for visualizing, analyzing, and communicating the role of texture in historical paintings. The scan provides images, which will be discussed here for the first time, representing the artwork in colour, with

the colour 'removed' to show only the relief, and with colour and texture combined. Venetian Renaissance art has been overwhelmingly understood through the prism of its colour, but I argue that the achievements of artists such as Tintoretto owe much to the understudied topic of Venetian texture. This talk will focus on the extent to which 3D scanning can help re-evaluate relationships between these two elements of painting and perceive old art anew. Furthermore, these scans show suggestive connections between the image and the topography of the painting's support, such as a thick seam arguably sculpting the edge of a tree trunk, contributing to its depiction. This invites reflection on the question of whether a technology for visualizing the surfaces of artworks can also help us better understand relationships between the substrate and the skin of paintings.

Keynote collective III

From body marks to figurative art: what we know about the Ice Age evolution of human visual culture

Paul Pettitt

Palaeolithic archaeology provides the only direct evidence for the appearance and long-term evolution of human visual culture. In recent years, advances in laboratory dating techniques have allowed us to create a broad chronological framework for the earliest visual culture, from non-figurative marks of the body left on cave walls before 65,000 years ago and small, modified animal parts worn about the body during the same period, that were both created by our Homo sapiens ancestors and our European sister group the Neanderthals, through the later appearance of figurative art around 37,000 years ago among Upper Palaeolithic Homo sapiens groups. The overwhelming dominance in this art of depictions of the large herbivores critical to survival, in both 'cave art' and portable art, reflects the evolution of our brains as hunter-gatherers dependent on the hunting of wild animals. I summarise here the state of knowledge of this appearance and evolution of visual culture, and report on recent advances in visual palaeopsychology, an inter-disciplinary endeavour at Durham University, UK, in which we seek to elucidate, scientifically, how the human visual system constrained and contributed to our earliest depictions.

Vision & Fiction, Depiction & Deception; The Place of Image

Persijn Broersen and Margit Lukacs

In this talk we will expand on the emergence of objectivity in the observation of the natural phenomenon and how ideals and ideologies fused with workaday practices in the making of scientific images. With this multi-angled survey we will show a wide variety of our own work, based on scientific atlases and art historical examples in which we connect shifting perspectives and ideologies, delusional imagery and the seemingly objective nature of the scientific image/depiction of nature. During this meandering journey through the history of perspectives we will reflect among others on the classification of exotic plants as described and illustrated in the book 'Hortus Cliffortianus'(1737) by Carolus Linnaeus, the MRI-scans derived of the radiology lab of Leiden University Medical Center, the history of perspective in Giotto's Scrovegni Chapel, the Manifest Destiny and the search for life on extrasolar planets, the framing of the landscapes in Jackson's Lord of the Rings trilogy (in a continent branded as Eden on Earth) and the survey of a bark from one of the oldest trees in the last primeval forest of Europe.

Colour and light

The Colours of Ugliness

Anya Hurlbert[1], Laura Monaghan[1], Fatima Felisberti[2], Alejandro Parraga[3]
[1]Newcastle University;[1]Kingston University London;[2]Universitat Autònoma de Barcelona

Theories of colour preference suggest that people's preference for colours in the abstract is largely determined by their preference for objects with which they are associated in memory. Because in visual art colours also may be considered to function in the abstract, even where objects are realistically represented, these theories suggest that aesthetic appreciation of paintings may be at least partly driven by colour preference. In Western culture, people of both sexes and different ages tend to prefer colours with cooler hues and higher saturation and lightness. The least preferred colours tend to be desaturated and dark. Dark yellow hues (browns) are particularly disliked. To explore the role that colour plays in aesthetic appreciation of pictures, here we analyse the colours associated with perceived beauty and ugliness in photographs. In an online experiment, 94 participants (94% of which were aged 16-25 years) each submitted four recently taken photographs, two that they considered ugly and two beautiful, with an indoor and outdoor scene for each aesthetic category. Photographs were restricted to scenes without people or other animate objects. Analysis of the image statistics showed that across both scene types, colourfulness was significantly higher for beautiful vs. ugly pictures, and for outdoor images only, mean image chroma was significantly higher for beautiful pictures. Hue distributions - whether obtained by an automated colour category classification algorithm or from independent human ratings of hue salience - also differed between beautiful and ugly pictures. In outdoor pictures, the proportion of "blue" was significantly lower and "brown" and "grey" significantly higher in ugly vs. beautiful categories. The results suggest that aesthetic responses to pictures are partially predicted by affective responses to colour, both positive and negative. The results further suggest that perception of ugliness is not merely the opposite of beauty, but a distinct process.

Form, material, light and meaning of the reliefs of Schoonhoven and their photographs of Wolleh

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July 2023 to January 2024 museum Prinsenhof, Delft, exhibited work of "zero" artist Jan Schoonhoven and art-photographer Lothar Wolleh. This exhibition showed a unique combination of real 3D artworks, matte white paper mache reliefs, together with depictions thereof, made by Wolleh in collaboration with Schoonhoven. We analyzed optical and perceptual mechanisms in seeing the real and depicted artworks, and what the depictions and Schoonhoven's texts tell us about the meaning.

The material, form, and color of Schoonhoven's reliefs was chosen to "capture the light". Schoonhoven precisely defined the dimensions of these artworks to this aim. From an optical perspective, matte white is special because locally the reflectance is independent of viewing angle and maximal. This renders the artworks' appearances strictly dependent on geometry and lighting. The elements representing "isolated aspects of reality" were repeated in a spatial rhythm creating a "larger organic reality of the basic creation in itself". It is unknown whether Schoonhoven was familiar with Gestalts psychology, but his works obviously present real examples of Gestalt phenomena. Interestingly however, the Gestalts and shape perception vary with the lighting direction and diffuseness.

Wolleh's photographs capture specific instances of such presentations. Wolleh worked with a Hasselblad camera, making square, high quality photographs. The jointly created depictions show the reliefs in high contrast imagery, appearing to be made in quite to very directed lighting from grazing angles. Such directed, grazing lighting creates high "bidirectional texture contrast" and relatively good and robust visibility of the geometry and depth of the structure. Schoonhoven wrote "zero doesn't aim for geometry...the geometrical aspect of zero arises from the element of repeating, the placement in rows ("Reihungen")" and noted to "strive for a more consistent objectification" by sculpting isolated realities using repeats and a-chromia. We will discuss this visually.

How to paint a smell. The use of cross-modal correspondence between smell and vision in art and design.

Francesca Di Cicco
Utrecht University

When we think about paintings, we naturally think about vision. We visit museums to see the paintings. Especially with naturalistic paintings, we admire how much they look like real life. Even our vocabulary when it comes to experience paintings is all about vision, (wrongly) considered "the noblest of senses" since Aristotle. But what if these paintings look so life-like because the image cues used by the artists appeal to more than just our eyes? We can imagine van Aelst's velvet cloths feeling soft and warm to the touch, the sourness and juiciness if we were to bite into that half-peeled lemon by de Heem, the cheerful noises made by the merry drinkers of van Ostade, and the fresh smell

of de Hooch's clean linens. This is called cross-modal perception. Of all the senses, the depiction of smell is the most elusive, given that the cross-modal correspondence between vision and smell seems to be far from universally shared. Even when based on semantic matching, i.e. on the recognition of the object source of the smell, cultural differences can change the colors associated with certain odors. This study aims to review the findings from empirical research on the cross-modal correspondence between odors and visual elements, like colors and shapes. Research focused on the ability to match colors to odor stimuli has an interesting application of allowing visually impaired people to experience the colors and images of artworks via the sense of smell while also enriching the multisensory experience of normally sighted people. I will also discuss studies showing the opposite correspondence, i.e. the association of odors with colors, which is especially relevant in product and packaging design. Finally, future research ideas to investigate color-odor correspondence in paintings will be proposed.

The appeal of Ganzfeld art: a matter of losing and regaining grip on depth?

Eleftheria Pistolas, Johan Wagemans
KU Leuven

What purpose do reference points of space serve in everyday life and what happens when we are devoid of any depth cues? A complete loss of depth perception rarely occurs in everyday life. However, when viewing a homogeneous visual field, i.e., a Ganzfeld, that contains no shapes, no objects of focus, merely homogeneous colored light, instances of a complete loss of depth can be experienced. Perceptual deprivation through Ganzfeld stimulation is characterized by hallucinations and instances of perceptual blackouts. Artists such as James Turrell have adapted the Ganzfeld effect to art installations, which are described as incredibly immersive aesthetic experiences. Here, we investigated the appeal of Ganzfeld art and its immersive component using a mixed-method approach by combining behavioral and neural measures with questionnaires, rating scales, and interviews. In a first experiment, 28 participants experienced an in-lab red Ganzfeld stimulus. In a second experiment, 45 participants experienced the in-lab Ganzfeld with varying colors. In a third experiment, 67 participants experienced a museum-based Ganzfeld artwork. Participants wore an EEG device, an eye-tracker and headphones, and they were given a dial to report hallucinations and blackouts. A remarkably interesting factor of the immersive Ganzfeld seemed to be the distorted depth perception and its relation to changes in bodily sensations. As such, a recurring report during the interviews entailed a description of the blue Ganzfeld as "an infinite sea of blue light" and the red Ganzfeld as "a flood of red light that surrounds you". A complete loss of depth perception has repeatedly been reported, accompanied by bodily sensations of imbalance and even dizziness in some cases. Interestingly, several participants mentioned their particular interest in the interplay between the layers of the experience, referring to the changes in depth perception during the light experience.

Keynote collective IV

From Pixels to Perception: Appreciating the structure in visual signals of material properties.

Hannah Smithson
University of Oxford

A photograph of an object can elicit a compelling impression of its material properties. However, the impression is easily corrupted. For example, manipulation of the intensity histogram associated with the object can have powerful effects on its appearance, sufficient to convince an observer that the object is made of different stuff. This might imply that the statistical distribution of the pixels in the image drives perception of material properties. But, countless counterexamples have been found for many summary statistics proposed to drive a specific percept. In richer stimulus presentations that preserve the constraints imposed by the physical world, the fragility of perception is typically reduced, as famously highlighted by J. J. Gibson in the 1950s and 1960s. But even now, 70 years later, experimental studies of perception remain limited in the extent to which participants are free to actively seek this information. I will discuss portrayals of material properties that depend on structured correlations across space and time, and conclude by presenting tentative steps towards running empirical studies on dynamic visual exploration of materials.

Picture this

Joost Swarte

The aesthetic gaze

Flattened Intensities, Intensified Flatness : Aesthetic Appreciation of Contemporary Abstract Art Changes as a Result of Context Information

Stefanie De Winter, Christopher Linden, Johan Wagemans
KU Leuven

This study investigates the impact of contextual information on aesthetic appreciation utilizing the exhibition, "Flattened Intensities, Intensified Flatness", featuring abstract art works by Hannah De Corte, Muesli Collective, Griet Moors, and Stefanie De Winter at BAC Art Lab (Leuven, October 2022). We conducted a mobile eye-tracking and questionnaire study with 103 participants who experienced the exhibition twice—initially uninformed and subsequently after viewing an informational video about the artworks. We investigated the differences in aesthetic appreciation of the works before and after receiving context information and we also assessed participants' ability to discern the artist's intentions, the used materials, and techniques, in the conditions with and without context information. Finally, we explored how these effects were modulated by expertise. Results revealed an increase in positive evaluations of the exhibition as a whole following the reception of contextual information. In general, the more conceptually vague and a-typical the materials of the works were, the less participants appreciated the works. However, we found a shift in the assessment of favorite works between the two sessions: after the first viewing, 'color' played the biggest role after the second viewing they conspicuously chose the less intense colorful work of De Corte, because they were moved by the intention of the artist. As expected, we also found that participants were better in discerning the artist's intention, materials, and technique after receiving context information. Experts generally rated the exhibition as more positive, while the difference between experts and novices decreased after receiving context information. Furthermore, eye-tracking data provided valuable insights into the viewing process. We found that viewing patterns were altered as a function of the specific information that was conveyed in the video. More particularly, material qualities that were mentioned in the video received more attention in the second viewing.

Disentangled Aesthetics - In Art Portraits Global Image Properties Predict the Beauty of the Painting but not the Attractiveness of the Sitter

Gregor Uwe Hayn-Leichsenring
University Hospital Jena

Art portraits are stimuli that can be evaluated based on two different aesthetic dimensions: (A) the attractiveness of the sitter, and (B) the beauty of the painting. While (A) is a dimension related to the depicted person, (B) is a dimension related to the composition of the artwork and, thus, the use of form and colors. Therefore, art portraits are ideal stimuli to investigate the relation between motif and way of depiction. In an online experiment, XX participants were asked to evaluate 192 art portraits from three different epochs (Baroque, Impressionism, and Expressionism) based on the attractiveness of the sitter or the beauty of the painting. Although the categorical difference between the two aesthetic dimensions was explained in detail to the participants, attractiveness and beauty are highly correlated (Spearman r = .658, p ¡ .001). Next, the stimuli were analyzed regarding their global image properties (GIPs: Fourier slope, complexity, self-similarity, anisotropy, and color measures). Linear regressions with backward elimination showed that attractiveness evaluations cannot be explained by GIPs (adjusted R2 = .022, p ¡ .05), while beauty evaluations can be associated with GIPs (adjusted R2 = .365, p ¡ .001). A deeper analysis showed that this effect is mainly driven by Baroque art portraits, most likely due to their higher realism as compared to Impressionist and Expressionist art portraits. To sum up, the two aesthetic dimensions of art portraits - the attractiveness of the sitter and the beauty of the painting -are related but can be distinguished by their relation to GIPs. Thus, the aesthetic value of the way of depiction can be linked to objective visual properties, while this is not the case for the aesthetic value of the motif itself.

On Mondrian, meaning and balance

Jeroen Stumpel

Seeing and Sensing

Yanai Toister
Shenkar College of Engineering, Design and Art

Surprisingly, the sensory aptitudes of bats have occupied a few analytic philosophers attempting to shed light on the associations between human vision and photography. Bat echolocation has been referred to as para-vision, quasi-vision or 'vision under heavy scare quotes.' In turn, these references were intended to credit or discredit the claim that humans 'see' through photographs and that such 'seeing' augments or replaces our biological sensory aptitudes.

Is the experience of echolocation, which bats practise closer to that of 'standard' vision or is it more like audition? Do bats process echolocation consciously or non-consciously? And does a particular sensory aptitude, such as vision, always feel like vision or could it feel like audition or touch? Similarly, can audition, touch or other sensory aptitudes can 'feel like' vision or be experienced as such? If this is within the realm of possibility then scholarship on photography must reformulate the reciprocal triangular relationship between sensing, visuality, and knowledge. This is the challenge posed by radio astronomy, time of flight systems and sensory substitution devices.

Active sensing is now part and parcel of numerous human methods, instruments and platforms for vision and visualization. Appropriately, this paper elucidates the distinctions between 'passive' and 'active' forms of sensing and problematizes them in their historical and contemporary contexts. It asserts that human vision and visuality have indeed become elastic in recent years but that the qualities and characteristics of this elasticity remain elusive. Thus, the evolving ways with which we study non-human forms of sensing, and how we taxonomize them, reveal present ethical stances and future epistemologies. Therefore, this article proposes that photography can be philosophized not only vis-a-vis human biology or neurology but also through the study of other vision and navigation systems, sentient, and non-sentient alike.

A Semiotics of Perspective and Vision in Donatello's Relief Sculpture

David Drogin
State University of New York, FIT

This paper addresses how the 15th-century Italian sculptor Donatello manipulated perspectival systems for representing spatial depth to complement narrative content. The focus is on the Miracle of Saint Anthony reliefs in Padua (c. 1450), in which Donatello distorted the new paradigm of linear perspective to give it signifying potential, as related to violent content and imagery of breached social norms. In the Santo altar reliefs, Donatello created two perspectival modes related to his narratives. For the two salubrious miracles of affirmed faith, the artist represented coherent, shallow spaces with rational perspective to articulate heartening, positive stories. In contrast, in two violent narratives with scenes of bodily dismemberment, Donatello created deep, illogical, vertiginous spaces that defy representational standards of human vision and spatial recession, as disjointed settings emphasize narratives' disjointed bodies and violation of decorum. This

paper correlates Donatello's technique to linear perspective's broader signficance in the period as considered by Panofsky and Damisch, among others. Specifically, if perspective was a triumph of rationality, of the human struggle for control, and extended "the domain of the self" through vision, what of when an artist disrupts the perspectival system? Donatello did exactly this to suggest the futility of reason and subjectivity's fragility in the face of violence and death, complementing narrative content with perspectival disorder. Comparison to Donatello's other work reveals different perspectival intentions. In earlier reliefs, Donatello used perspective with a low viewpoint and vertical orthogonals in declarative, denotative ways that simply echoes figures' movement. In Padua, instead, perspective is a demonstrative, semantic tool adding meaning rather than emphasizing physical movement or trajectory of the viewer's eye.

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