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Interview

Turning Scientific Data into Physical Art - Sculpture as an aesthetic language [1]

An interview with California based Artist Adrien Segal

Adrien Segal

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Through its diverse range of activities Scenario aims to promote the arts in education, including the facilitation of intellectual exchange between (language) educators and artists from different backgrounds. In the following interview Adrien Segal, a data artist based in California, reflects on the interrelationship between science and art and, in doing so, focuses especially on sculpture as an aesthetic language. In her art work she interprets the poetics of statistical information by translating data into lines, forms, and materials that reveal abstract concepts and unseen phenomena as communicative, sensory, aesthetically engaging artworks. Her work seeks to transcend the divide from objective scientific data towards that of experiential knowledge.

SCENARIO (SC):
Hello, Adrien. You are currently artist in residence in Cork and recently gave a very impressive talk about your innovative art. From a SCENARIO-perspective it is of particular interest how you navigate the space between the Sciences and the Arts. You are sometimes referred to as a data artist. Could you perhaps briefly explain to readers of this journal what a data artist is, by giving one or two concrete examples from your work?

ADRIEN SEGAL (AS):
Hello!
For the definition of data art, I'll revert to my friend and fellow data inspired artist Loren Madsen's definition: "Art whose form in large part is determined by data or information." Beyond that, the term is very new, and essentially describes the overlap of two distinct fields, so the term "data artist" is open to interpretation.

In my case, I have a BFA (Bachelors of Fine Art) in Furniture Design, and data found its way into my work in a rather unexpected and circuitous way. I have always been deeply inspired by the natural landscape, and I

had a very personal experience on the coast in California where I live. This experience lead a thread of research looking at the cyclical pattern of the ocean tides, in which I sourced an archive of tide charts from the scientific organization that records tide data in the United States, the National Oceanic and Atmospheric Administration (NOAA). I translated a full cycle of Tide charts from San Francisco Bay, twenty nine days worth, into hand bent steel with a wood frame. Essentially I created a sculpture that captures the patterns of the ocean tides in tangible form that can be experienced by the body.

Fig. 1: A data sculpture visualizing tidal charts as a physical experience to reveal the subtle unseen patterns in the ocean's sea level as the tides rise and fall in a daily and monthly cycle. For further details regarding this specific project see: https://www.adriensegal.com/tidal-datum – © Photo by A. Segal

Other artworks I have created have made tangible water consumption statistics, snowfall trends, the pattern of the Polar jet stream, and the progression of a wildfire, to name a few.

It is worth mentioning that the term "Data Physicalization" has been suggested to refer to data-driven physical artifacts, including data sculpture. There are examples from very far back in human history, such as Incan Quipus from 2600 BC. If you are intrigued to see the full chronological archive and other examples of this kind of work, there is an online resource at www.dataphys.org.

SC: *Albert Einstein stated in 1929: "Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution." So let's imagine Albert Einstein were still alive and having a conversation with you during which he makes this*

very statement. What would you say to him in response?

AS:
Einstein makes a great point - imagination is immensely important. Although I don't believe there is a hierarchy between knowledge and imagination. Knowledge sans imagination is just a set of facts without context or meaning whereas uninhibited imagination starts to border on delusion, it never connects back to reality. Imagination allows us to see connections that knowledge alone is perhaps not capable of - it allows us to draw on diverse inputs like memory, emotion, and stored knowledge, across the past and present time and into future possibilities, making connections between seemingly disparate ideas. Creativity and imagination are indelibly linked, as they were for Einstein, but are still grounded in reality. Therefore knowledge (through experience) is also a contributing force that adds to our ability to imagine.

SC: *Leo Tolstoy claimed: "Science is meaningless because it gives no answer to our question, the only important question for us, 'What shall we do and how shall we live?'" As in your work you seem to transform scientific data into aesthetic shape: do you think your works of art can offer insights that science cannot? Is there anything in or about your works of art that tells us what we shall do and how we shall live?*

AS:
The role of the artist is to ask questions rather to find answers. Art cannot tell us what to do or how to live, but it can be a trigger for self-reflection, provoking us to question where we find meaning and how we seek to answer fundamental questions about life.

Unlike Tolstoy, I don't see science as completely meaningless. I do question the scientific convention that we must eliminate all emotional involvement in order to objectively study the world around us. Science alone is not a complete view of life, and can only help in the search for meaning to a point. This hard division between the rational and the emotional is problematic because it doesn't acknowledge that humans are innately emotional, and that scientific information can only be synthesized into knowledge in a subjective human. In the words of physicist Wolfgang Pauli, "Meaning is not a fundamental function of reality, but an interpretation superimposed by a human observer."

Tolstoy has another quote about science I think adds to the conversation. "The only real science is the knowledge of how a person should live his life. And this knowledge is open to everyone."

Data is present in my work because I am investigating how information can become knowledge through a process. By interpreting scientific data into physical art, the information is given a context and becomes accessible to an

observer in a more personally engaging way. Neither art nor science alone can give us the knowledge of how we should live, but if we start looking in unexpected places, I do believe this knowledge is open to everyone.

Fig. 2: Arctic Sea Ice Patterns: Sculptures in cast glass, a material that shares properties of light diffusion, reflection, and colour saturation to draw a parallel with the rapidly changing Arctic climate. For further details regarding this specific project: https://www.adriensegal.com/sea-ice-albedo – © Photo by A. Segal

SC: *We are facing huge challenges in the 21st century which require creative solutions. Creativity is, however, not yet sufficiently promoted at universities. For many decades Theology, Science and Business have served as models for education, would you share Scenario's perspective that the time has come for the arts to play a leading role in the field of education?*

AS:
I feel that the division and specialization of fields has lead to many of the problems we are now facing, because invariably the world is complex and dynamic - if one overlooks how these fields of study as defined by the current educational system are interconnected, we are only seeing a sliver of reality, through a limited lens. By this logic, a cellular biologist, a geneticist, an anthropologist, and a psychologist can each look at a human being and come up with different structural accounts of the same subject. Thinking about art not as an object or a performance, but as a philosophical

practice, art can offer a multivariate viewpoint that unifies these disparate concepts in a way that reflects the time and place in which we are living. Current modes of academic education could benefit greatly from this kind of practice, (but that benefit is not limited to education, it is available to all.)

SC: *According to American scholar Eliot Eisner education can learn from the arts. For example, by referring to science-based subjects he says that students "are learning the lessons of certainty". And he sets this against what is cultivated in the arts: "In the arts diversity and variability are made central." Using your creative work as an example: What exactly can teachers and students possibly learn from artists?*

AS:
I'm not sure I can speak to the perspective of Eliot Eisner, but I have been quite inspired by the work of John Dewey, the American philosopher, psychologist, and a major educational reformer in the 20th century. His book on aesthetics - "Art as Experience" proposes a common misperception that a work of art is simply the object, suggesting us to consider thinking of art as the development of an experience. The "real" art is the connection between the experience of the person creating the artwork (what Dewey called "doing") and the experience of the viewers perceiving the art ("undergoing"). The object is the site of this exchange.

A quote by Roy Ascott summarizes this idea well: "Stop thinking about art works as objects, and start thinking about them as triggers for experiences." This refined perspective changes the conventional definition of art, and in my mind, aptly describes how art, as an experience, can personally effect and contribute to one's life, including education.

Beyond the perception of art, artists are constantly in the position of self-questioning their definition of "success", which I believe is something each of us needs to answer for our individual selves rather than looking to external definitions of achievement, as educational systems tend to do.

SC: *Scenario focuses on language education. If you looked at your art as a special kind of language, what would you say are its characteristics? How can the language of your art be learned, understood and used?*

AS:
Spoken and written language is only one of many methods used to communicate ideas or feelings.

Our sensory perception provides us with a multivariate means of understanding the world around us. Symbols, marks, smells, sounds, textures, gestures, for example, all provide an immense amount of non-verbal information and add to the richness of experience. From a basic standpoint, the

characteristics that I employ in my work can be broken down into to the already well established language of visual art - line, shape, form, color, value, texture, orientation, and composition.

My creative approach considers our full capacity for sensory perception as a means to communicate information and ideas. The analytic information is embedded in the structure of a sculpture as a physical "language". Although I myself have not (yet) explored integrating smell, taste, or sound in my work, there are a number of artists who have! (Sissel Tolaas' *An Alphabet for the Nose*, Moritz Stefaner's *Data Cuisine*, Janet Cardiff's *Forty-Part Motet*).

Regarding how my art can be learned understood or used - I prefer not to prescribe how viewers should "read" the work, or what they take away from it as I believe there is value and beauty in the ambiguity of interpretation. I want the artwork to stand on its own, to invite viewers to draw on their intuitive skills to infer the meaning behind the work, and as a clue, the title usually indicates the data source.

SC: *If you were offered generous funding for an arts in education project, what kind of project would you like to be involved in?*

AS:
Hmmmm, great question, almost overwhelming since there are so many different avenues that have not been explored regarding how the arts can change the education system. I would begin by looking to the past to identify examples of the ways in which non-western cultures did not delineate art as separate from other parts of life (the way that contemporary western culture does). I could imagine running an experience based workshop for students of diverse disciplinary backgrounds that combines an understanding of theory and practicing physical skills as a unified endeavour, or the "why" and the "how", rather than teaching them separately.

Interview conducted by Manfred Schewe in August 2019