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ALICANTE \* 19/20/21/22 SEPTEMBER 2018

**CONGRESS PROCEEDINGS**

EURAU18 alicante  
RETROACTIVE RESEARCH  
**CONGRESS PROCEEDINGS**

ISBN: 978-84-1302-003-7  
DOI: 10.14198/EURAU18alicante

Editor: Javier Sánchez Merina  
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**Titulación de Arquitectura**

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# Beauty Emerges to Reoccupy its Rightful Status, in Post-digital Architecture

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## **Synopsis**

The enigma of beauty is culturally fascinating, and even more so when a new knowledge about it is emanating from the fields of neurobiology, and mathematics.

In post-digital architecture, beauty is not a singular idea; beauty is many, and the architects' task is to employ human decisions, including intuitive ones, so as to augment digital gains. It is timely to shed cultural taboos that the word beauty associates with, and act upon its pursuit architecturally.

**Key words:** Beauty, Visual-thinking, Intuition, Intellectualization, Mathematics, Neuroscience.

Aesthetic consideration and active visual thinking, since the late 1940s, were suppressed and ceased to exist as leading generators in the architectural design process. It started when function took over as the form generator, augmented by the critique on the 'hegemony of the eye'<sup>1</sup>, and the long-term intellectualization<sup>2</sup> of the design process, endorsing what was understood as rational and objective. Suspecting intuition and lateral thinking - as both didn't count for too long as the needed rigorous thought process for servicing society - led to focusing on the derivatives of rational process, and not necessarily on what people like - is rather tragic, as we ended with an environment that is often alienating, holding back the joy that pleasurable architecture brings, including the experience of beauty.

A prevalent view amongst the architects who fought 'the eye regime', could be traced, for example, through the influential book written by Juhani Pallasmaa, which highlighted the critique on Western ocular-centric tradition, while blaming modernism and even more the era between 1960s to 1990s for extending the "hegemony of vision" to a fault. His book - *The Eyes of the Skin, Architecture and the Senses*, Academy Editions, was published first time in 1995, sold out, and re-published in 2005 - was written poetically, focusing on the denigration of a design process driven by visual thinking. The poignant subtitles that reflect on that attitude: 'Crisis of Ocularcentrism', *The Narcissitic and Nihilistic Eye*, 'Retinal Architecture and the loss of plasticity'.

The paradox is that the first common measure amongst architects to judge a building, is still its capacity to create a great aesthetic experience; the experience of beauty

We cannot define beauty in simple terms, yet, neuroscientists proved, that our civilization couldn't exist without the recurrence of experiencing pleasures - while the experience of beauty is one of them - a characteristic that reflects on our neurobiological structure. The experience of beauty rewards people neurobiologically with an immediate reaction of an aesthetic pleasure, which leads to actual physical health and a feeling of wellbeing. Semir Zeki, the UCL Prof. of Neuroscience and neuroaesthetics<sup>3</sup>, found that when we look at things we consider to be beautiful, there is an increased activity in the pleasure reward centers of the brain. There is a great deal of dopamine in this area, also known as the 'feel-good' transmitter. "The reaction is immediate."<sup>4</sup> We know immediately when we experience beauty and the intensity of that emotional experience can be quantified digitally.

Until the late 1970s, neuroscientists erroneously understood the humans' seeing mechanism, as a passive one. Nevertheless, even when the opposite was proved more than thirty years ago<sup>5</sup>, its dissemination into culture, as we can witness, is still hardly there, due to the culturally loaded negative attitude towards the 'eye regime', which is still shared by many architects. The scientific facts about

<sup>1</sup> Martin Jay, *The Denigration of Vision in 20<sup>th</sup> C. French Thought*, University of California Press, 1994.

<sup>2</sup> Marvin Perry, *An Intellectual History of Modern Europe*, Houghton Mifflin Company, 1992.

<sup>3</sup> Prof. Zeki is a British neurobiologist at University College London, a world expert of the visual brain and the neural correlates of affective states, desire and beauty that are generated by sensory inputs. Active in the fields of Neurobiology and Neuroaesthetics.

<sup>4</sup> Semir Zeki, <https://neuroaesthetics.net/2011/08/21/toward-a-brain-based-theory-of-beauty-ishizu-zeki-2011/>

<sup>5</sup> Semir Zeki, *Splendors and Miseries of the Brain, Love, Creativity, and the quest for Human Happiness*. Wiley-Blackwell, 2009.

the seeing mechanism and its role are still completely missed.

Moreover, seeing is the key active element in gathering knowledge, claims Zeki, and visual thinking is crucial in creative thinking. Architecture wouldn't develop well through history, if visual thinking was 'retinal' only and not processed in the brain.

Dissemination is slow when scientific findings are in contradiction to prevalent cultural beliefs, even when the findings are studied and quoted, as could be observed, for example, when Harry Francis Mallgrave, architectural historian, sift new knowledge through his set of beliefs, in his books since 2011, where he communicates through quoting and explaining new scientific advances in neuroscience, but his conclusions, take the reader back to his cultural standing from before<sup>6</sup>, ( and in agreement with Pallasmaa's view).

Moreover, between 2011 and 2014 it was Zeki who proved that when we experience different types of beauty – visual, musical, mathematical and moral – each aesthetic pleasure lead immediately to an increased activity in the pleasure reward centers of the emotional brain, and the intensity of that experience of beauty can be quantified digitally<sup>7</sup>, (an important measure in science).

These findings made me interested in the subject of mathematical beauty, and I found out that in mathematical studies of the universe - the aesthetic pleasure of mathematical beauty is particularly of interest, since unlike architects, or amongst other fields in the Humanities, mathematicians never lost interest in beauty, particularly mathematical physicists, as Robbert Dijkgraaf<sup>8</sup> confirms, that beauty plays an important role, and he adds<sup>9</sup> that these days are the golden days of the trust in beauty as a pointer of truth about the universe. The classic example is Einstein's Theory of Relativity, which when submitted in 1915, it was described by every mathematician as sheer beauty. "A hundred years on, no discussion of the role of aesthetics in scientific theory seems complete without its inclusion."<sup>10</sup>

As the English mathematician G. H. Hardy wrote:<sup>11</sup> "...The beauty of a mathematical theorem depends a great deal on its seriousness, even in poetry the beauty of a line may depend to some extent on the significance of the ideas which it contains..."<sup>12</sup>

Mathematicians are confident in listing the characteristics of beauty; a quality that is unexpected, fresh, significant, and economical. When we design, we are familiar with the moment, like mathematicians, when all fall into place. We are pleased, as that moment is when the beauty was noted. As the Mathematician Ron Aharoni wrote: "The sensation of beauty, arises when order is suddenly revealed in

<sup>6</sup> Harry F. Mallgrave, *The Architect's Brain; Neuroscience, Creativity, and Architecture*, Wiley-Blackwell, 2011.

<sup>7</sup> Toward A Brain-Based Theory of Beauty, Tomohiro Ishizu, Semir Zeki see <http://dx.doi.org/10.1371/journal.pone.0021852>, and added by Prof. Semir Zeki in a recorded conversation with Yael Reisner, in 2015. Experience of mathematical beauty and its neural correlates, *Front. Hum. Neuroscience*, 13 February 2014, <http://dx.doi.org/10.3389/fnhum.2014.00068>

<sup>8</sup> Robert Dijkgraaf is the mathematical physicist who has made significant contributions to string theory. The Director of the Institute for Advanced Study and Leon Levy Professor since July 2012.

<sup>9</sup> As he did in his augural lecture at MIT, when he became the director of the Institute for Advanced Study. (IAS)

<sup>10</sup> *The Economist*, weekly magazine, November 2015.

<sup>11</sup> G. H. Hardy , *A Mathematician's Apology*, Stellar Editions , 1940.

<sup>12</sup> *Ibid*, p.88



disorder,<sup>13</sup> and what comes across as order for us today, as architects, might be different than sense of order in the Renaissance.

The very use of the term 'post digital architecture' was a remarkable shift into admitting and recognizing the human role in digital design, and there is a fresh interest in new architectural range of beauties that stems from the growing acknowledgment in human's judgment, and cognitive intuition, as well as in its significance for a creative output<sup>14</sup>, but also for arriving at what people like. Artificial Intelligence researchers, opting lately to press on the exploration of Intuitive Artificial Intelligence, as it expands beyond human's perception, awareness, and decision making, and augmenting digital gains<sup>15</sup>.

It is the architects' creative role to bring new beauty to cities, and to substitute alienation with a wider pallet of emotions involved. Architects should try to remember that beauty is not a singular idea. The beautiful is many! We have to remember that the daily experience of beauty not only raises humans' wellbeing, but makes humans healthier – hence without beauty the idea of ecological design - architects utmost concern these days - fails too.

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<sup>13</sup> Ron Aharoni, Mathematics, Poetry and Beauty, World Scientific, 2014. P.30.

<sup>14</sup> Gerd Gigerenzer, Gut Feelings: The Intelligence of the Unconscious, Taschenbuch, 2008

<sup>15</sup> Maurice Conti, TED Talk, Portland, 2016, [https://www.ted.com/talks/maurice\\_conti\\_the\\_incredible\\_inventions\\_of\\_intuitive\\_ai](https://www.ted.com/talks/maurice_conti_the_incredible_inventions_of_intuitive_ai) Conti is currently Director of Applied Research & Innovation at Autodesk. He also leads Autodesk's Applied Research Lab, which he built from the ground up. Conti and his team are responsible for exploring the trends and technologies that will shape our future.

## Biography

**Yael Reisner.** Reg. architect in Tel Aviv, born there, and lived in London since 1990. A designer, an academic, researcher, writer. Has a PhD from RMIT Melbourne, AA Diploma, RIBA part 1 & 2, and a BSc in Biology.

Yael Reisner Studio is an architectural research led practice.

She taught design nine years at the Bartlett, ten internationally, and was a guest professor at Peter Behrens School of the Arts / Architecture and Design, Düsseldorf, 2017.

Reisner wrote with Watson the book 'Architecture and Beauty, Conversations with Architects about A Troubled Relationship', Wiley UK, 2010.

Designed Take My Hand, Rights and Weddings, 2014, Barcelona.

The guest-editor of September 2019's Issue of Wiley's AD magazine.

The head curator of the Tallinn Architecture Biennale in 2019.

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