



The man holding the hat in the model of Louvre branch in Abu Dhabi, is the architect of the building: Jean Nouvel, checking, in this way, the shadows in Benjamin Samuel Koren's simulated construction.  
Foto: Benjamin Samuel Koren

Frankfurter Allgemeine Zeitung, 10 July 2010

## The Demiurge at the Computer

By DIETER BARTETZKO

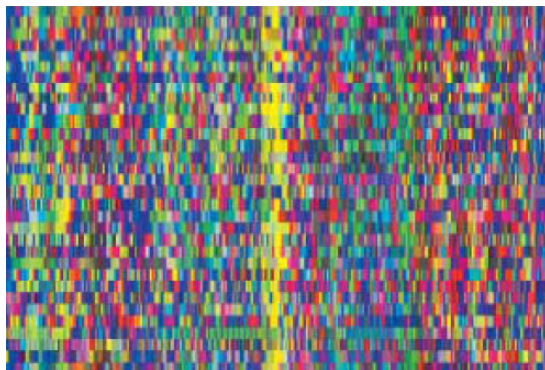
In Frankfurt, Benjamin Samuel Koren uses computers to reveal the essence of what constitutes beauty, or, to expose how that which is already visible - looks beautiful. The wide range of his work reveals anything from works of music to stock market fluctuations. His office also works with world-known contemporary architects. How does one get into such a profession?

"Once the Count mentioned in Bach's presence that he would like to have some clavier pieces for Goldberg, which should be of such a smooth and somewhat lively character that he might be a little cheered up by them in his sleepless nights." Almost everyone who is a fan of the Goldberg Variations knows the tale surrounding Count Keyserlingk and his harpsichordist Johann Gottlieb Goldberg. However, with regards to the music's ability to cheer up the listener, there are as many opinions circulating as there are fans. You can teach, read and write as much as you like about music, but at the end of the day, it remains a matter of emotions. Like every emotion, it eludes final, unambiguous definition.

Initially, this view is shared by the writer as he stands bewildered in front of a work entitled 'Goldberg Variationen 30+2', on an endless sheet of fine paper, the surface of which oscillates between spectral colors of all conceivable variations yet in fascinating harmony. Is the tonic violet-blue? Or predominantly aqua green? Perhaps coral red? Depending on where the shifting eye locks its view, the overall impression changes dramatically, despite the staunchly rigid structure of the orthogonal basic order that underlies the piece.

Who paints such erratic and bewildering compositions? Gerhard Richter? Or is this colored ordeal, a cross between discipline and ecstasy, a previously unknown work of the later Paul Klee? But what if one felt like one of the unsuspecting listeners in 1992, conned by the German comedian Hape Kerkeling, who, disguised as an avant-garde Polish opera singer and composer, shrieked "Hurz!" to the shrill dissonances coming from a concert grand piano, which the reverential audience, led up the garden path, readily accepted as an experimental piece of New music?

This train of thought is suddenly interrupted by the discreet hum created by a number of computers, and brings the writer back down to Earth. In front of one of them sits Benjamin Samuel Koren, computer specialist and creator of these colored Goldberg Variations. For months, he had been brooding over Bach's notes, encrypted them, combined them, assigned them with color values, programmed them and finally transposed the magic of the Baroque musical piece into a color frenzy.



Koren's visual computer representation of Bach's Goldberg Variations



Master of the computer and an office called "One to One": Benjamin Samuel Koren

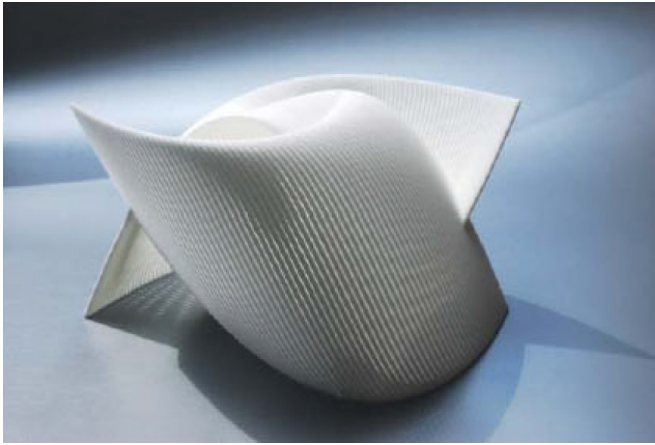
Even after twenty minutes of highest concentration, during which Koren strives to explain his approach with the utmost patience, the whole thing remains a mystery, but viewing the image is a fascinating experience. Should we call them pictures? Prints? Analyses? A variety of holograms? This also applies to Koren's computer creations called 'Deutscher Aktienindex 30+1' and 'Dow Jones Industrial 30+1'. Unlike his firmly structured Goldberg Variations, here, the painterly style

- can one even say this of a machine? - is rather soft and impressionistic. The colors slide into each other, one thinks of precious silk, of excerpts from Monet's Water Lilies, in prosaic moments, perhaps, also of underwater cameras with heavily impaired optics or of LSD. One would have never thought, though, that such gentle tides would represent the nervous twitches of our capitalist markets?

Nor that someone like Benjamin Koren would take Bach and Bourses, feelings and speculations and abstract them into a cold deluge of digits, which he then streams through a computer. The young dark-haired man with the precisely parted, wavy dark hair and the extremely polite manners is reminiscent of a mature Törless or Hanno Buddenbrook who might be sitting in front of a piano, one afternoon, and glowingly strive for Glenn Gould's touch. Even the house in which Koren has his studio, fits his appearance. It is a former villa of the moneyed bourgeoisie, turn-of-the-century class with colossal columns, green patinated copper and the first distinct traces of modernity. Shaded by ancient trees, it is situated near the Frankfurt Botanical Gardens, where once the richest of the rich had their estates built by well-known architects the likes of Hermann Muthesius and Peter Behrens.

Creaking wooden steps will snap you back into Frankfurt's present, in which such villas have sadly been converted into desolate lawyer practices, consulates or, at best, tenement houses. On the second floor, Benjamin Koren opens the door. One step beyond the threshold and you will find yourself in a room that would nowadays be rented immediately as luxurious apartment. A century ago it was the entree to a series of suites. Work tables are placed here, the design of the stucco on the walls and ceiling, tastefully mediated between Art Nouveau and Antiquity, is barely recognizable under several layers of thick coats of paint. Koren's work space might originally have served as the smoking or music room, styled in subtle expressionism, glazed closets with finely serrated rungs, panels that provide muted acoustics.

In the center of the vast room is a giant screen, on which Koren animates weirdly amorphous clusters of forms. One thinks first of algae, jellyfish and sea anemones, viruses and bacteria, or even of Hermann Finsterlin's bizarre architectural fantasies of the 1920s. There are also three-dimensional models that Koren has created in his computer – you would want them immediately placed as miniature sculptures on a pedestal in a museum. He continues to explain the principles of his work, which he worked on at the university. The reference to Finsterlin, it turns out, was not too farfetched: Koren's formations, which he calls the production of a '3D shape-synthesizer', are inspired by 'blobs', the stars of contemporary architecture. With a slightly critical undertone, Koren explains that he, however, wanted to filter out the essence of the seemingly arbitrary formal language of contemporary architecture and wanted to relate them to the almost forgotten, classical studies of proportion.



Benjamin Samuel Koren dealt with computer "blobs" in his thesis, which he modeled after veritable computer algorithms

Foto: Benjamin Samuel Koren

"To build them, it would take the most absurd methods that are completely contrary to their shape: One would first have to carefully disassemble portions of the design, then shape each part individually and eventually weld together all parts to a most inglorious composition - this scenario shows how much Finsterlin's designs are pure paper architecture." This assessment is of the architectural historian Robert Harbison in 1994. Koren and his digital computer process, however, can disassemble digitally created blobs such as Finsterlin's and the current exaltations of contemporary architecture, but he does not weld them simply into an "inglorious composition". On the contrary - thanks to "a number of harmonics in the computer," Koren explains, "there is a direct mathematical relationship to musical harmony." Shapes extracted from the Fibonacci number sequence - which in turn is based on the Golden Ratio - results in "particularly fine and delicate shapes".

Those of us, to whom such technical terms make our heads spin like a deluge of digits flowing through faulty hard drives, will immediately think of concepts like 'music of the spheres' or the crystalline, precisely defined, fixed-ruled orbits of Pythagorean cosmology. Thus, the image of the dreamer is complete, who, a stone's throw away from the economic Saint Vitus dance that is the Frankfurt stock exchange and protected by the shade of the Botanical Garden's palm leaves, contemplates bygone eras of the Occident - as immune to accidents as Pythagoras and his crystal ball were three thousand years ago. But below the sign of Koren's company "One to One", on the antique portal of the villa, a sign spells out the formula "computational geometry".

One may be annoyed by the typical Americanisms of international management, but in this case it is justified: Koren and his colleagues are working on projects all over the world. Their most important current projects are the "Louvre Abu Dhabi" by Jean Nouvel, the Philharmonie in Paris, also by Nouvel, and the Elbphilharmonie Concert Hall, by Herzog & de Meuron of Basel.

A look at the computer simulations by these architects, and one encounters Koren's 3D shapes again. Although the programmer did not design the buildings, it soon becomes obvious that they would not be under construction without him. The office One to One calculates the technical data, the dimensions, the volumes, including the swings, jumps, slopes and curves of the exterior and interior spaces. Without them, the architects, contractors, modelers and carpenters could not work. More importantly, only precise models, down to the last millimeter, can accurately check the suitability of the designs, their appearance, their staying power, its light conditions and, particularly important in these cases, its acoustics.



Benjamin Koren uses the example of the Louvre Abu Dhabi to explain what these lapidary statements really mean: Nouvel designed it as an elegant yet casual cluster of white cubic pavilions on Saadiyat Island (Island of Happiness), covered by a metal dome similar to a large mushroom top. The architect calls this architectural Capriccio "a dome", having been inspired by the traditional earthen domes of Arabia. This rather trivial incident he refines by perforating its dome modeled on the shadows created by of palm leaves on desert sand, and so the art pavilions and the plazas are dived into a light-dark fantasy.

One to One was hired to create a light test model - several layers of braided aluminum, held together by a stainless steel rim and composed of trapezoidal parts, each of which required its own form due to the dome's curvature. Fifteen thousand single parts not only had to be calculated at scale 1:33, but also manufactured, assembled and finally flown to Abu Dhabi as a completed model with a circumference of 18 meters to test the light and mirror effect.

Benjamin Koren points at some photographs of this process. One sees the familiar: Construction workers lift the shimmering silver artifact, building containers, protective helmets and blue overalls. Standing between the assemblers and engineers is Jean Nouvel, wearing fine clothes, a black hat and a concentrated expression on his face. One photograph in particular draws particular attention to itself, in it, one appears to float between the pavilions underneath the shade of the dome. But the truly surreal part in this picture is a hat which, placed on a wooden pole, is suspended underneath the dome. It does not matter that one soon realizes, that the headgear is Jean Nouvel's very own hat, he simply wanted to test the quality of the light rays and spots of his design more precisely - with this picture you find yourself drawn into the world of René Magritte.



The dome of the Louvre being delivered in Abu Dhabi. Foto: Jens Kestler

Caught in between this puzzle of chance, which fits so well into Koren's encrypted Goldberg Variations, you can hardly manage to follow his other explanations, until the conversation turns to the Elbphilharmonie, where he was responsible for the digital implementation of the acoustic interior of both its concert halls. But the renewed attention of the listener suddenly encounters a reticence on the part of the lecturer. In plain terms: Benjamin Koren chooses not to comment what is currently a very delicate project facing issues such as breathtaking cost explosions. Nor does he want to get in the middle of ongoing negotiations between the Hamburg Senate, the construction company Hochtief and the architects. While currently a group of lawyers and a parliamentary committee will have the final say, the programmer chooses to remain silent.

However, Benjamin Koren does not hesitate to confirm that he greatly admires the design by Herzog & de Meuron, whose glass faceted concert tract rises from a hard-edged brick stone base (an old warehouse built in 1966) like a geode from a rock. And much more, he admires that the Swiss architects and the acoustician Yasuhisa Toyota have been trying for months to create the best acoustics in the interior of the Philharmonic.

Toyota is known to belong to the "vine terrace" group of acousticians, which has its prototype in Hans Scharoun's Philharmonie in Berlin, where the audience is layered around the central stage like vine terraces. Since it is in these layers where every little bump and bulge will influence the reverberation of the hall, Toyota and the engineer Keiji Oguchi tested the acoustics on a 1:10 scale plywood model of the Hamburg hall. They made use of speakers emanating beeps at frequencies so high, even bats cannot hear them, to fine tune the acoustics until the perfect sound space is achieved.

Koren is as familiar with such procedures as he is with scores by Bach. Because with Jean Nouvel's Philharmonie de Paris, he and the carpentry workshop Ackermann, have built a similar acoustic model according to the standards of the acoustics, working with the same acousticians as in Hamburg.

Digitized and photographed, these miniature structures are hard to distinguish from the real thing. In brochures and journals they already function, like key witnesses to the increasing level of the digitization of reality, as doppelgangers of their actually built counterparts. But in Benjamin Koren's office, one views them as architects have already done centuries ago - as works of art that allow us to glimpse an entire scheme we would only be able to see excerpts, fragments or portions of.

Models turn us to Gods who can view and organize the world from a high vantage point. That's how the Egyptians and Minoans must have felt; taking models of the houses they lived in to their graves. It may have been a fear of the unknown that prompted them to do so. A more overt tendency for self-idolatry, however, you can see in medieval sculptures of church founders who, holding church models in their arms, were thus symbolizing their power over town and country. And it really was a pragmatic turning point when, in Italy during the Renaissance, the word 'modello' was derived from 'modulo', meaning 'measurement'. Architects had to present to their clients the mini structures called "modello" before they were allowed to proceed with the realization of their designs. It was the nobility and intellectuals of the late eighteenth century that adored Bramante's model for St. Peter's Basilica, late sixteenth century city models of Munich and Regensburg or the famous picturesque cork models of Greek temples, for in models one subjugates the world more or less consciously.

From this vantage point, Benjamin Koren goes one step further. For he and his computer are the central node, where all the threads, or shall we say streams of data, converge. Without it, there is no way from design to model, nor the first working prototype of a perfect three-dimensional anticipation of the final form. One must not speak of feelings of omnipotence to imagine where the man sitting at his computer takes his confidence from, who, using music or stock market prices, gives shape to emotions by using his proprietary programs.

That someone like Koren would help Jean Nouvel deliver the specifications for the Paris Philharmonic, was therefore inevitable. This project was hailed by critics as "a built soundscape", described in this newspaper in 2007 by Joseph Hanimann as "moving rapidly, like a thousand celli". Its outlines and interior perspectives appear in Benjamin Koren's study as siblings of his own, omnipresent amorphous 3D sculptures.

Koren has transcended his dream world into the reality of his actual profession, built, however, on solid foundations. Born in Frankfurt, he moved to Miami at age 14, where he studied architecture, music and film. He continued his studies in London where he furthered his education at the prestigious Architectural Association while working at a large engineering office. As one half programmer and the other half Jazz pianist, with an urge to create his own compositions, Benjamin Koren continued his journey working for more than two years as a programmer for Herzog & de Meuron in both their Basel and Hamburg offices.

In his Frankfurt office you cannot find a concert grand or an upright piano. But one often listens to Bill Evans. When asked about his role models, this brilliant jazz pianist and composer cited early recordings of Lennie Tristano, who exemplified how musicians build their improvisations within a tight structure. Evans spoke of this amazing process, which has the power to "unify musical elements". This unification of opposites leads us back to Koren's work and the fusion of extreme opposites.

For a piano and a computer, a roaring blob and a quiet Blues, streams of data and a play of colors fit together like a silent score and it's audible musical counterpart. A defiant outsider might react by thinking of the proverbial 'fish without a bicycle'. Alfred Brendel, however, also fascinates his listeners with lectures on the relationship between architecture and music, ever since he bid the stage farewell.

Benjamin Koren responds to such references as politely dismissive and surprised, as he would react to the suggestion that the unconscious urge of a Demiurge manifests itself in his Goldberg Variations. He much rather relies on his love for music, his capabilities as a programmer, the skills of the carpentry workshop Georg Ackermann and the Nuremberg modelmaker Markus Honka. The visit to his studio is over, and leads the writer back onto to a roaring thoroughfare which links, past rows of century old villas, a motorway with the Frankfurt Exhibition Center. One can still hear the music of Bill Evans emanating faintly from the open studio windows. The computers, however, work silently.

Source: F.A.Z.

German original text published: 10.07.2010

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