

Art in the age of machine intelligence

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Hi, I am Refik. I am a media artist. I use data as a pigment and paint with a thinking brush that is assisted by artificial intelligence. Using architectural spaces as canvases, I collaborate with machines to make buildings dream and hallucinate.

You may be wondering, what does all this mean? So let me please take you into my work and my world. I witnessed the power of imagination when I was eight years old, as a child growing up in Istanbul. One day, my mom brought home a videocassette of the science-fiction movie "Blade Runner." I clearly remember being mesmerized by the stunning architectural vision of the future of Los Angeles, a place that I had never seen before. That vision became a kind of a staple of my daydreams. When I arrived in LA in 2012 for a graduate program in Design Media Arts, I rented a car and drove downtown to see that wonderful world of the near future.

I remember a specific line that kept playing over and over in my head: the scene when the android Rachael realizes that her memories are actually not hers, and when Deckard tells her, they are someone else's memories. Since that moment, one of my inspirations has been this question. What can a machine do with someone else's memories? Or, to say that in another way, **what does it mean to be an AI in the 21st century?** Any android or AI machine is only intelligent as long as we collaborate with it. It can construct things that human intelligence intends to produce but does not have the capacity to do so. Think about your activities and social networks, for example. They get smarter the more you interact with them. If machines can learn or process memories, can they also dream? Hallucinate? Involuntarily remember, or make connections between multiple people's dreams? **Does being an AI in the 21st century simply mean not forgetting anything?** And, if so, isn't it the most revolutionary thing that we have experienced in our centuries-long effort to capture history across media? In other words, how far have we come since Ridley Scott's "Blade Runner"? So I established my studio in 2014 and invited architects, computer and data scientists, neuroscientists, musicians and even storytellers to join me in realizing my dreams. **Can data become a pigment?** This was the very first question we asked when starting our journey to embed media arts into architecture, to collide virtual and physical worlds. So we began to imagine **what I would call the poetics of data**. One of our first projects, "**Virtual Depictions**," was a public data sculpture piece commissioned by the city of San Francisco. The work invites the audience to be part of a spectacular aesthetic experience in a living urban space by depicting a fluid network of connections of the city itself. It also stands as a reminder of how invisible data from our everyday lives, like the Twitter feeds that are represented here, can be made visible and transformed into sensory knowledge that can be experienced collectively. In fact, data can only become knowledge when it's experienced, and what is knowledge and experience can take many forms. When exploring such connection through the vast potential of machine intelligence, we also pondered the connection between human senses and the machines' capacity for simulating nature. These inquiries began while working on wind-data paintings. They took the shape of visualized poems based on hidden data sets that we collected from wind sensors. We then used generative algorithms to transform wind speed, gust and direction into an ethereal data pigment. The result was a meditative yet speculative experience. This kinetic data sculpture, titled "Bosphorus," was a similar attempt to question our capacity to reimagine natural occurrences. Using high-frequency radar collections of the Marmara Sea, we collected sea-surface data and projected its dynamic movement with machine intelligence. We create a sense of immersion in a calm yet constantly changing synthetic seaview. Seeing with the brain is often called imagination, and, for me, imagining architecture goes beyond just glass, metal or concrete, instead experimenting with the

furthermost possibilities of immersion and ways of augmenting our perception in built environments. Research in artificial intelligence is growing every day, leaving us with the feeling of being plugged into a system that is bigger and more knowledgeable than ourselves. In 2017, we discovered an open-source library of cultural documents in Istanbul and began working on "Archive Dreaming," one of the first AI-driven public installations in the world, an AI exploring approximately 1.7 million documents that span 270 years. One of our inspirations during this process was a short story called "**The Library of Babel**" by the Argentine writer Jorge Luis Borges. In the story, the author conceives a universe in the form of a vast library containing all possible 410-page books of a certain format and character set. Through this inspiring image, we imagine a way to physically explore the vast archives of knowledge in the age of machine intelligence. The resulting work, as you can see, was a user-driven immersive space. "Archive Dreaming" profoundly transformed the experience of a library in the age of machine intelligence. "Machine Hallucination" is an exploration of time and space experienced through New York City's public photographic archives. For this one-of-a-kind immersive project, we deployed machine-learning algorithms to find and process over 100 million photographs of the city. We designed an innovative narrative system to use artificial intelligence to predict or to hallucinate new images, allowing the viewer to step into a dreamlike fusion of past and future New York. As our projects, delve deeper into remembering and transmitting knowledge we thought more about how memories were not static recollections but ever-changing interpretations of past events. We pondered how machine could simulate unconscious and subconscious events, such as dreaming, remembering and hallucinating. Thus, we created "Melting Memories to visualize the moment of remembering. The inspiration came from a tragic event, when I found out that my uncle was diagnosed with Alzheimer's. At that time, all I could think about was to find a way to celebrate how and what we remember when we are still able to do so. I began to think of memories not as disappearing but as melting or changing shape. With the help of machine intelligence, we worked with the scientists at the Neuroscape Laboratory at the University of California, who showed us how to understand brain signals as memories are made. Although my own uncle was losing the ability to process memories, the artwork generated by EEG data explored the materiality of remembering and stood as a tribute to what my uncle had lost. Almost nothing about contemporary LA matched my childhood expectation of the city, with the exception of one amazing building: the Walt Disney Concert Hall, designed by Frank Gehry, one of my all-time heroes. In 2018, I had a call from the LA Philharmonic who was looking for an installation to help mark the celebrated symphony's hundred-year anniversary. For this, we decided to ask the question, "**Can a building learn? Can it dream?**" To answer this question, we decided to collect everything recorded in the archives of the LA Phil and WDCH. To be precise, 77 terabytes of digitally archived memories. By using machine intelligence, the entire archive, going back 100 years, became projections on the building's skin, 42 projectors to achieve this futuristic public experience in the heart of Los Angeles, getting one-step closer to the LA of "Blade Runner." If ever a building could dream, it was in this moment.

Now, I am inviting you to one last journey into the mind of a machine. Right now, we are fully immersed in the data universe of every single curated TED Talk from the past 30 years. That means this data set includes 7,705 talks from the TED stage. Those talks have been translated into 7.4 million seconds, and each second is represented here in this data universe. Every image that you are seeing in here represents unique moments from those talks. By using machine intelligence, we processed a total of 487,000 sentences into 330 unique clusters of topics like nature, global emissions, extinction, race issues, computation, trust, emotions, water and refugees. These clusters are then connected to each other by an algorithm [that] generated 113

million line segments, which reveal new conceptual relationships. **Wouldn't it be amazing to be able to remember all the questions that have ever been asked on the stage?**

Here I am, inside the mind of countless great thinkers, as well as a machine, interacting with various feelings attributed to learning, remembering, questioning and imagining all at the same time, expanding the power of the mind. For me, being right here is indeed what it means to be an AI in the 21st century. It is in our hands, humans, to train this mind to learn and remember what we can only dream of.

Thank you.

19.08. 2020