Between Buildings and Brains

Research Framework

A relation between architecture and neuroscience has been researched several times, conclusions were made based on the specific givens back then whether it is architectural or in neuroscience. Now those givens are changing drastically in both fields. Architecture is no longer a static geometry, now architecture is getting more sensitive, it's starting to see and dare I say "feel". not only in a passive way but with time it is starting to be active, to be responsive, to the environment it's hosting and the surrounding environment. Not only is it responsive in a "stupid" automated way, it is starting to think, by analyzing, solving and learning. With the help of sensors, Artificial intelligence, Machine learning, Robotics and mechanical engineering, architecture is becoming more alive by the day.

Architecture is becoming more than just a shelter, a different conversation between people and buildings is being initiated, having architecture as a responsive entity influencing the human psychology/brain, and because of neuroscience, we're now able to understand what is happening inside the brain, by understanding which parts of the brain are being active, whether the brain is being engaged in an imaginative process, problem solving, recalling data, etc. also stress, depression, PTSD can be observed through MRI.

A closed feedback loop can be created now between buildings and brains, using devices like MRI we can understand what is happening inside the brain and by using Artificial Intelligence and Machine learning we can manipulate some parameters in the environment, whether it's lights, colors, geometry, sound, smell. And observe how those changes affect the brain scans, and then we can even manipulate the brain by changes of these parameters.

Having space colonization as a context, there are many challenges for space colonization to be a reality. One of the main obstacles is the psychological challenges that astronauts are going to face in Mars. Researches have found that due to astronauts' separation from earth, they develop a lot of psychological issues, and a lot of efforts are being spent on how designs can accommodate astronauts psychologically, keeping in mind that a lot of the psychological issues are still speculations, there might be unexpected issues that can rise.

With the help of this study, architecture can be one of the main solutions to deal with and accommodate some if not most of the psychological issues that will/might occur, by reading and analyzing what is happening on a psychological level, and applying a change in the "architecture" according to what those astronauts are feeling at a certain moment.

Research question/Hypothesis

By using the full potential of Artificial Intelligence, machine learning and MRI How can architecture influence/manipulate the human brain.

In the context of Space Colonization, how can architecture help overcome the psychological obstacles.

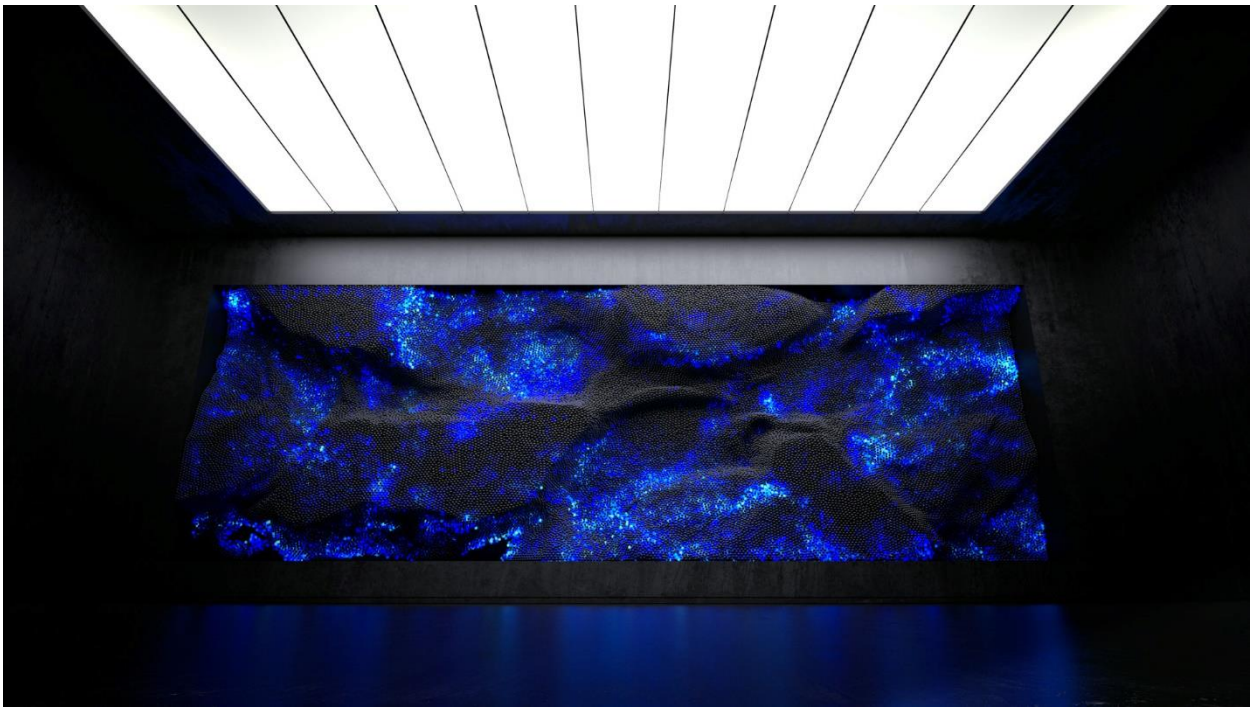
Research objectives and expected results

Expected results would be having a fully automated functional AI system, that can read each person's brain scans, analyze them and adjust the parameters of the space (Light, colors, geometry, smell and sound) based on what needs to be achieved whether it is helping productivity, general comfort, dealing with psychological challenges like stress or depression, etc.

Research methodology

First a good understanding for how the brain works, which parts of the brain engages which actions, then how the brain reacts to each of those parameters: Geometry, light, colors, sound and smell (maybe focus on one or two aspects throughout the study).

Then build a VR model with all those parameters, then have a sort of a brain scan device to measure, which parts of the brain is being used, this process will help collect the data about the brain, and which parameters engages which parts of the brain. A reverse process is then going to be adapted to try to manipulate the brain into getting into different states.



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