Nature, Neuroscience and Design

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In this study, architecture/design projects provided greater connection between people and nature, through technology. For this, we addressed the principles of biophilia and neuroscience and built the basis for the generation and improvement of creations. The participants developed parametric projects inspired by nature, which were tested with sensors, to correct the initial proposals and then reinserted in the projects. Under the conceptualization of concepts related to biodesign, biophilia and neuroscience, we used visual technologies such as programming, artificial intelligence (AI), neurophysiological sensing and augmented reality (under a scientific methodology) to analyze based on quantitative data the relationship of visual perception human, digital and morphology, with well-being indicators. Dynamic one of the study objectives was the creation of projects inspired by nature and, for this, use high computational technology that allowed reproduce natural patterns, emulate complex and hierarchical arrangements, calculate natural growth, work with seasonal changes and variations, etc. We conducted the study in three stages. In the first, we presented principles of biophilia and neuroscience, and the participants began to design and model parametrically, after an introductory lesson in Rhinoceros and Grasshopper. In the second part, the projects were tested with sensors and artificial intelligence systems that provided results that were evaluated, so that in the third stage, a remodeling and final measurement would be carried out. The results of the papers were presented in high resolution images and commented in a final evaluation with the participation of all. Details of what the study were: at first, the participants invited to the study carried out parametric designs inspired by nature, using the software Rhinoceros and Grasshopper, in order to positively stimulate those who observed the result. These projects were then tested through facial expression analysis using artificial intelligence. An Artificial Neural Network (RNN) analyzed the facial expressions of the participants from videos recorded during the observation of the projects developed in the workshop itself and the degree of valence (positive and negative) triggered by each project was recorded. In parallel, still in this intermediate stage, the projects were tested with an electroencephalography equipment by one of the study team members, observing how much each project causes brain modulations in the attention and relaxation of the observer, which shows another kind of measurements for positive and negative valences. These data were used to correct the initial perception and soon after, they were reinserted into the projects. This study and methodology indicate a new possible way to predict how people's well-being experience will be before the construction of projects and raises interesting questions about the clarification and rationalization of more intuitive design processes.

KEYWORDS

Artificial intelligence, Parametric Design, Bioinspired morphologies, Biophilia, Status sensors