

De Humani Corporis Fabrica – Fabricating and Measuring Emotions through Architecture

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I. ABSTRACT

This paper describes an experiment that took place at the Digitale Werkzeuge at the Fachbereich Architektur of the TU Kaiserslautern during the Winter Semester of 2013/2014. The subjects of the experiment were students of Architecture who attended the elective course “De Humani Corporis Fabrica – Fabricating Emotions through Architecture” in which the experiment took part. The title of the experiment, “De Humani Corporis Fabrica: Fabricating emotions through Architecture” is a reference to the first anatomy treatise with the same name (from Latin to English, “On the Constitution of the Human Body”), in which Andreas Vesalius presents dissections of human bodies in order to explain its inner workings. The title was suitable for the experiment also because the original Latin word for fabrica can have the multiple meaning of “fabrication, constitution,or construction” and the elective course had the goal to teach students of architecture to design and construct architectural settings with digital tools of design and fabrication. The overall purpose of the experiment was to evaluate the emotion reaction of subjects who would design, fabricate, assemble, and perform in architectural settings, taking in consideration the direct effect that the design elements in such settings would produce specific physical and emotional effects on the subjects, or as the subtitle suggests, “fabricating emotions through architecture. The ultimate goal of the experiment was the evaluation of emotional reaction to changes in the sensory perception when a user is performing the same actions in settings that have the same design but significantly different dimensions. The goal of the course was to increase students’ awareness of the direct effect that variation in the values of basic design parameters, such as scale and dimensions, produces on the human body, while conditioning movement. Psychophysiological changes in the body’s sensory perception during the performances were evaluated through the combined use of biometric technology, a Presence Questionnaire and a SAM chart. The course was attended by 4 students who participated as subjects in the Experiment. The course was offered during the Winter Semester of 2013/2014 and the experiment took place on the last day of the course, on February 14th. The Experiment had the technical support of the DFKI – Deutsches Forschungszentrum für Künstliche Intelligenz, which provided the machinery necessary to collect the biometric data during the Experiment. The experimental results support the main research Hypothesis H1 – a user’s emotional response to design objects as “compelled or not compelled”, “positive or negative”, “aroused or not aroused” and “dominant or dominated” can be evaluated through objective measurements of emotion. The results collected through the Presence Questionnaire and the SAM charts show that the majority of subjects experienced a high level of “Presence”, “Pleasure” and “Arousal”. Most subjects describe their emotional response to the performance with the objects as “positive”. Most subjects reported to be very involved in the experiment, found the performance sensually very engaging, were very involved by visual aspects and involved by haptic and auditory aspects, while remaining aware of events around and the surrounding space. This suggests that subjects were focused on the most important aspect of the experiment which had to do with the movement of the body while performing with the objects, the kinaesthetic sense. It also suggests that they were involved by the sense of vision and hearing. This confirms a high-level of engagement and suggests that the experience was immersive, although other results show that subjects were somewhat distracted by the suit, mask, and e- health platform. Therefore, results support Hypothesis H2, which suggests that the feeling of “presence” and emotional activation can be intentionally induced through the performance with analogical models, in this case, architectural settings. Results also show that most subjects were involved in experiment and lost track of time during the performance. This suggests that the feeling of “presence” and arousal situations can be intentionally induced in real-space, but further research is necessary to understand which specific design elements are responsible for this. All subjects rated the experiment as a very good learning experience and found that performance art techniques enhanced their creativity and capacity to design. Therefore, results also support hypothesis H3 which suggests that the somatic techniques of “performance art” and “emotional design” are an effective strategy to develop corporeal awareness and stimulate the creativity of students and designers. The amount of participants in the experiment was only four which according to the quantitative research tradition could not be understood and treated as quantitative material. Although a qualitative research approach would be possible to use in such a context and eventually providing interesting results, the same methods used in the experiment can be applied to a larger experimental context. Also, the used approach can be understood as part of the educational content of the course and as training of research methods which incorporate innovative methodologies in the teaching of design and sensitize the students to the emotional impact of design objects in the human body. The results can be seen, for that reason as suggestive, as this experiment was a pilot for future experiments which will involve more subjects and means.The experiment described in this paper shows that PQ, SAM, and biometric technology can be used to objectively discriminate arousal responses. Results confirm that it was useful to include biometric machinery in the experiment, to observe how user emotions are triggered while experiencing

design objects, as the participants in the experiment, in this case students of architecture, could see in the computer screen the live feedback of the physical experience of performing in the design settings. The aim in the experiment was to observe peak and limit reactions that would provide for a wide scale of physiological measures. In future experiments, it is planned to integrate the use of EEG and to add to the experimental setting eye-tracking sensing technology to record the position of the user and where s/he is looking at.

2. REFERENCES

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3. AUTHOR BIOS

Maria da Piedade Ferreira

Dr. Maria da Piedade Ferreira is an Architect, Master of Sciences in Architecture PhD in the same field. Working as a Lecturer Fachbereich Architektur TU Kaiserslautern since 2012, M.P. Ferreira has been developing research on the topic of Performance Art as a learning tool for Architects. Her work has been dedicated to the artistic exploration of the holistic relationship between Body, Movement and Space. Her work pursuits the understanding of user’s empathic connection with Architecture as a source of well being. As a lecturer of Architecture, her work has included experiments with students which introduced notions of neuroscience, the somatictraining of performance art and emotion measurement methodologies.

Andreas Kretzer

Andreas Kretzer is an architect (TU) and production designer (HFF) with an assistant professorship for Digital Tools at the Faculty of Architecture at TU Kaiserslautern since 2011 and a guest professorship for architectural design and film at the Faculty of Architecture at TU Munich in 2016/2017. With a primary focus on architectural representation in both traditional and digital media, he is exploring perception and immersion in architectural environments.