

## Perception based architecture for contemporary health care design

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### I. ABSTRACT

Over the last years, in part due to the demographic trend towards an older population, in part due to increasing numbers of environmentally triggered illnesses, the amount of admissions, as well as the average length of stay in Intensive Care Units (ICU) has been rapidly increasing. Unlike hospitality, the healthcare sector is interested in a shortened stay in the hospitals. In an attempt to find factors for the slow recovery process and at the same time to develop countermeasures, GRAFT was invited by the Charité, one of the most important hospital and research facilities in Germany, to develop a prototype for the ICU unit of the future.

Prof. Spieß from the Charité Hospital in Berlin is involved in research about the causes and condition of "delirium". She identified the relevance of stress factors such as noise pollution, distractions, the lack of views, of light, and of privacy as important factors that influence the healing process and patient outcome. A lack of daylight and insufficient lighting conditions, for example, generally triggers fatigue and dizziness during the day, which causes sleep disorders at night.

With this in mind two rooms were designed that are carefully tailored according to the perception of the patient, attempting to eliminate the above mentioned stress causing elements, usually present in the design of healthcare facilities. They are keeping the patient in a more familiar, soothing physical environment and within the natural circadian cycle, in order to support a faster healing process and lower remission rates.

Following consultations with specialists ranging from sleep researchers to experts in lighting and acoustics, the project Parametrische (T)Raumgestaltung was born.

The space on either side of the bed was freed up and all technical equipment was moved into a wooden headboard behind the patient. The flickering displays of the vital signs are therefore not directly visible for the patient and allow for a more relaxed experience in the ICU. A further significant decision was to remove alarm signals and sounds of vital data away from the patient into a so-called observation room that each patient can see into through a window. The patient is not distracted and petrified by the constant display of data, but at the same time can see all activities, which minimizes the feeling of uncontrollable dependence on staff and medical personal.

More than in any other spaces, the ceiling above the bed is the most visible surface. It is designed as a large-format LED media screen that bends, in order to cover as much of the field of vision as possible. A series of images, like blue skies, moving clouds or green leaves, was developed in cooperation with the media design agency Art+Com. Daylight-supporting measures that reinforce circadian rhythms during the day, indirect, warm light in the evening, and individually controllable illuminating content provide

doctors and patients with a broad spectrum of possibilities, with the aim of creating a comfort-reinforcing experience of space and time. These interventions are reported to improve melatonin suppression - helping patients to stay awake and focus during the day and sleep soundly at night.

The construction of the prototypes was finished in 2013 at the Charité Campus Virchow-Klinikum in Berlin, Germany. Currently a team of scientists and doctors is monitoring the outcome and long-term effects of the rooms as part of a three-year research program. Final research data will be available in early 2017.

### 2. AUTHOR BIOS

**Christoph Korner** is a founding member of GRAFT, an award winning design firm with offices in Los Angeles, Berlin and Beijing. Projects range from Master Planning, Urban Design, Architecture, Interior Design, Exhibition Design, to Product Design. In addition his work has been exhibited and published on several occasions and he authored articles and books. In recent years his dedication gravitated increasingly towards teaching and academia, culminating in his current position as Chair of Interior Architecture at Woodbury University in Los Angeles.

In 1998 **Thomas Willemeit** established GRAFT in Los Angeles together with Lars Krückeberg and Wolfram Putz. With further offices in Berlin and Beijing, GRAFT has been commissioned to design and manage a wide range of projects in multiple disciplines and locations. GRAFT has won numerous national and international awards and earned international reputation throughout its 18-year existence.