ETH
Eidgenössische Technische Hochschule Zürich
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Interactive sound & vision to facilitate falling asleep

Bachelor Thesis for students ZHdK Interaction Design, Spring 2011

Background: Sleep – It refreshes us like nothing else. It can be occasionally elusive, almost always comforting, and definitely essential to our survival. And although we spend 33% of our lives asleep, we barely give it a moment's notice – until we cannot sleep.

Besides the use of sleep enhancing medication, there are several "conventional" methods that can influence physiological body functions during rest and, thus, improve the depth and quality of sleep. Smooth sounds or music, a gloomy warm light, or little rocking movements can have remarkable effects to the sleep or to the phase of falling asleep.

We are currently developing a Somnomat. This apparatus should be used to investigate and control the onset and process of sleep in order to improve sleep behavior. Connecting a conventional bed to an existing tendon-based parallel robot allows the execution of different kinds of movements in different translational and rotational degrees of freedom, with different amplitudes and frequencies (see figures below). Additionally, sound can be displayed by a special multi-speaker sound system that allows projecting arbitrary sounds sources or music close to the user's head. Visual effects can be displayed on large projection screens to further facilitate falling asleep.

Task: Design audiovisual prototypes that adapt to the subject's current state of alertness to finally trigger falling asleep. Assess different interactive auditory and visual displays within the existing Somnomat. Based on the assessment, redesign your prototypes and evaluate them again.

Our Support: To warrant interactivity of the sound and vision, we can provide different types of sensors such as accelerometers, gyroscopes, motion tracking systems etc. During the time of the thesis, you will have also assess to our CAVE to assess different auditory and visual effects.

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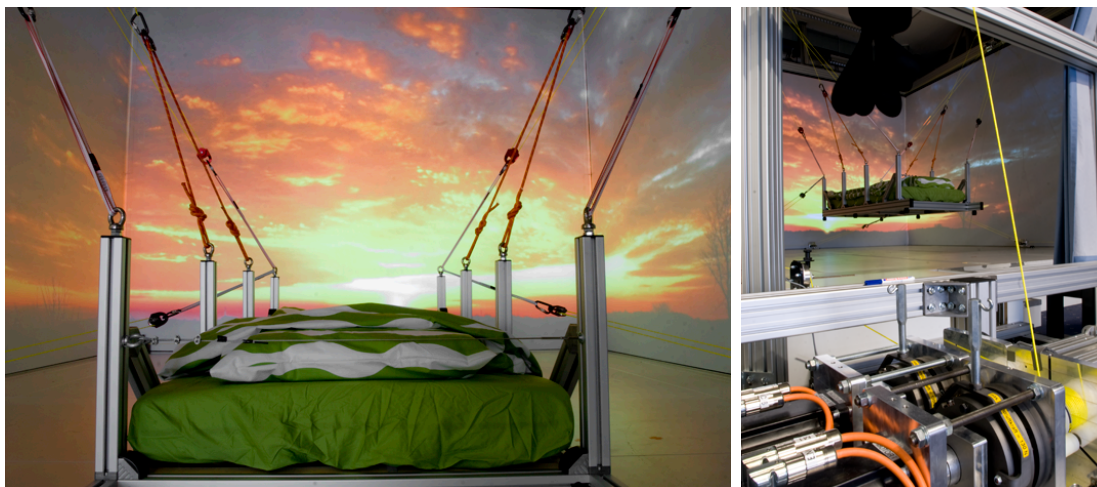
Somnomat*: Conventional bed connected to a tendon-based parallel robot within a CAVE*