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Using biophilic illusions to promote well-being and nature connectedness in interior spaces

Stanford engineers have developed biophilic illusions, which are technologies that augment building interiors using elements from ambient nature such as shifting sunlight, swaying tree shadows, and wildlife sounds. Biophilic illusions aim to animate spaces with real-time nature cues and sensory stimulations to promote occupant well-being and connectedness to nature.

It is well-documented that exposure to nature experiences has a direct link to positive well-being outcomes. However, humans spend almost 90% of their time indoors, which can cause a disconnection from the outside world and negative psycho-physiological consequences. An intervention to address this issue is biophilic design, which incorporates natural elements into interior spaces such as wood furniture, expanded windows, and vegetated surfaces. While biophilic design is gaining momentum, windowless and contained spaces, such as offices, confinement cells, and hospital rooms, are unable to provide a connection to the natural environment. On the other hand, biophilic illusions can facilitate human-nature connectedness in confined spaces and allow occupants to experience feelings of relaxation and engagement associated with outdoor nature information.

Initial testing of low-fidelity mockups of biophilic illusions with participants have highlighted their feasibility and potential to foster nature connectedness and enhance well-being. Importantly, based on a technology acceptance and use model and survey, performance expectancy, social influence, and pleasure-seeking motivations are significant factors that impact and can enhance the behavioral intention of individuals to use biophilic illusions. Consequently, biophilic illusions have the potential to improve well-being and offer an experience that bridges the gap between nature and the indoor environment.

Stage of Development:
Prototype
Continued research – Physical exposure of in-person participants to biophilic illusion design interventions

Applications

- Promotion of nature connectedness and well-being in confined spaces
- Improving well-being of workers, particularly in open floor plan offices
- Enhancing patient experiences in hospitals
- Promoting health equity in low-income communities
- Providing a solution for spaces that cannot have windows for visual and acoustic privacy requirements, like psychiatric outpatient counseling rooms.
- Aiding patients with seasonal affective disorder

Advantages

- Effective in windowless and contained spaces
- Provides a real-time connection to nature, thereby eliciting the benefits associated with nature exposure
- Retains visual and acoustic privacy while enhancing nature connectedness
- Can be flexibly integrated into newly designed infrastructure or incorporated into existing infrastructure

Publications

- "Using Biophilic Illusions to Promote Nature Connectedness and Occupant Wellbeing in the Built Environment" has been accepted for publication in the i3CE 2024 Conference Proceedings, which will be published in the ASCE Library.
- "Using UTAUT2 model to explain public acceptance of biophilic design interventions in the built environment" is ready for submission to Indoor and Built Environment journal.

Innovators

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