LuciEntry HOME: An Anywhere Lucid Dreaming Induction Prototype

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ABSTRACT

Lucid dreaming is a unique state of consciousness where one is aware of dreaming whilst asleep, allowing the dreamer to control their dream content, offering various mental and physical health benefits. Existing research has utilised lab settings with manual induction techniques with researchers to induce lucid dreams, which is costly and time-consuming. Thus, there is a need for an autonomous system that would easily integrate lucid dreaming induction techniques and trigger them autonomously. In response, we present LuciEntry HOME, a portable system that utilises (1) a mobile app to guide users through pre-sleep cognitive training and (2) light, battery-powered, and wireless components for external stimulation. LuciEntry HOME emphasizes portability, autonomy and modularity, reducing the reliance on sleep labs and researchers to trigger the external stimulus manually in an effort to make lucid dreaming more accessible and facilitating future research on its application.

CCS CONCEPTS

• **Human-centered computing** → **Interaction devices**.

KEYWORDS

Lucid dreaming; induction; portable; autonomous; modular; interactive devices; prototype; system

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*Both authors contributed equally to this work.

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1 INTRODUCTION AND RELATED WORK

Lucid dreaming is a unique state of consciousness where one is aware of dreaming whilst asleep [1]. Lucid dreamers are also aware of their ability to deliberately control the elements of their dreams [3, 8]. Lucid dreams have been associated with many benefits for both mental and physical health, including finding creative inspiration and improving problem-solving skills. It can even be used as a form of therapy to treat sleep disorders [5–7].

Recent research into lucid dreaming induction has utilised multiple lucid dreaming induction techniques to induce lucid dreams in a lab setting, such as combining pre-sleep cognitive techniques with external stimulation [2, 4]. However, lucid dreaming is a challenging task to achieve, requiring dedicated practice, and attempting to do so in a lab setting with researchers further complicates the process and affects the ability to induce lucid dreams.

2 LUCIENTRY HOME

Therefore, we designed LuciEntry HOME, an anywhere lucid dreaming induction prototype. This system utilises multiple lucid dreaming induction techniques [9] and features portable take-home components. Each component contains a specific type of stimulation to help induce lucid dreams. These prototype components are light, portable, battery-powered, and wireless, allowing users to put them anywhere in their bedroom. These prototype components are controlled by a server and work individually. The system reads a user's brain and eye signals using Electroencephalogram (EEG) and Electrooculography (EOG) sensors, determines the sleep stage of the user with our own sleep stage algorithm, and delivers stimulation through the use of interactive technologies at the appropriate sleep stage to induce lucid dreams autonomously. While automation eases the process of lucid dream induction, the modularity of the system also allows plug-and-play of the input and output components, which gives researchers or users the flexibility of component

swapping between the desired stimuli and delivering stimuli with different combinations.

3 CONCLUSION

Through the development of LuciEntry HOME, we hope to reduce the reliance on sleep labs and researchers' manual labor for lucid dream induction. The modularity of the system allows researchers to try different combinations of external stimulation and even add newly established external stimulation that can be discovered in the future to help induce lucid dreams. With this new system, we hope to facilitate further research into lucid dreams and perhaps make lucid dreaming a new HCI research sub-field in the future.

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