

Anti Sleep Paralysis Device

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Goals & Intent

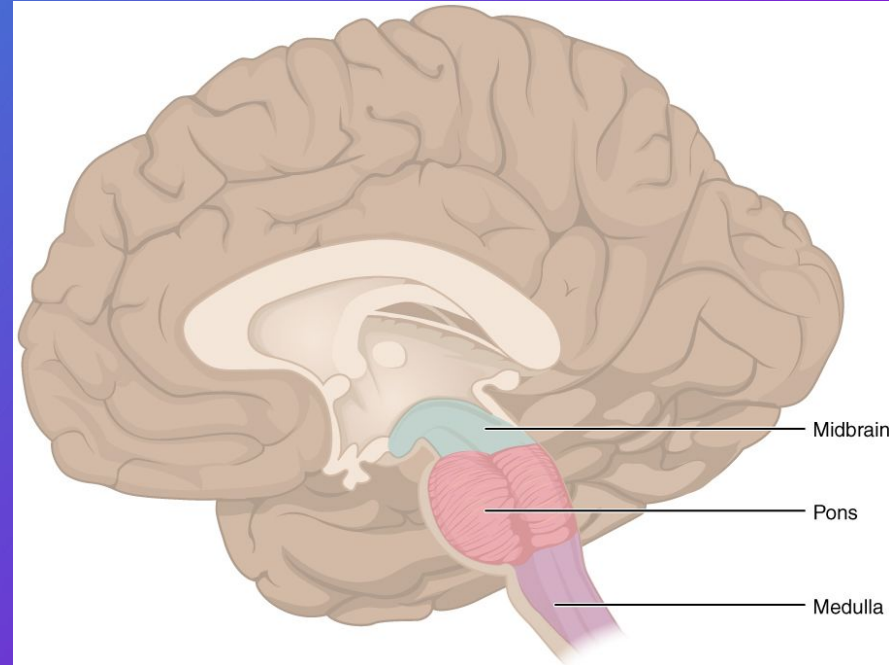
Waking up the sleeping person when they are feeling trapped and unable to escape an unwanted **sleep paralysis** state.



What is sleep paralysis?

A sleep state in which a person's mind is awake while body remains asleep.

- Occurs during REM (rapid eye movement) when a person is in a deep sleep cycle
- Temporary paralysis (postural atonia) is triggered by the pons and ventromedial medulla
- Neurons fire rapidly

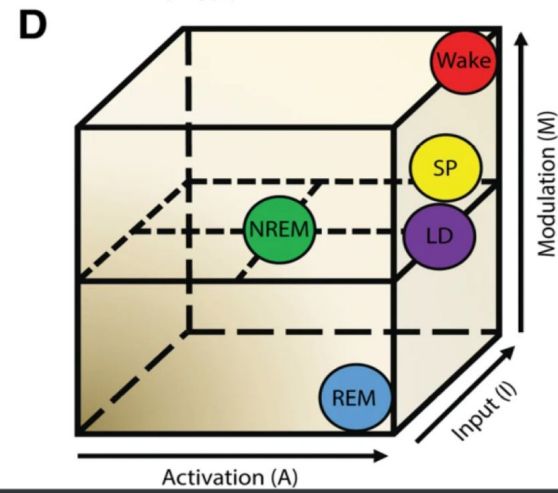
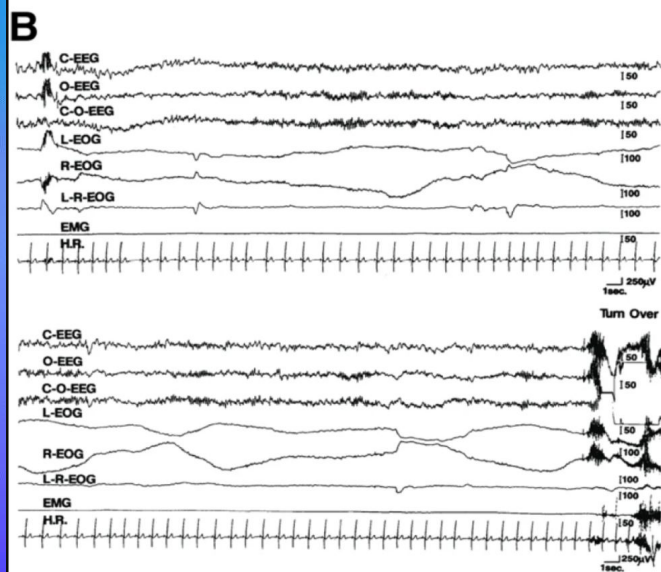


What does this device need to learn?

Inputs:

- Brain signals during sleep (signals during light sleep, deep sleep, NREM, REM cycles and restful sleep, nightmares, lucid dreaming, and sleep paralysis)
- Physical body movement
- Eye movement
- Chemical release and activity
- Heart/breath rate/body temperature





What is the device's response?

Outputs:

- Music
- Ambience noise
- Ambience light
- Color light choice
- Smooth vibrations (mattress, face device, pillow, etc)



Some concerns

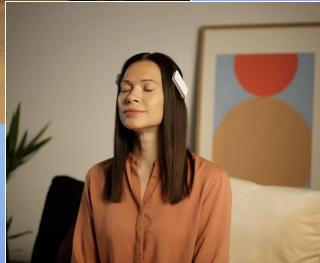
- If the device is attached to the head, how are you going to comfortably measure ones brain signals?
- Will it fall off during the night?

Existing Resources

1. Apps that help to improve sleep without technological sensors. Instead they ask you questions about your sleep and ask you to log your sleep patterns. E.g. Dr. Lullaby
2. Scientists at Kyoto University trained an A.I. to visualize an image imagined by the subject.

Existing similar devices

1. NeoRhythm emits corresponding dominant and accompanying frequencies to which the brain synchronizes, creating a perfect mental environment for the desired state of mind



2. Smart bracelets, watches, and apps that measure your body temperature, heart rate, and movement. These do not measure your brain signals.

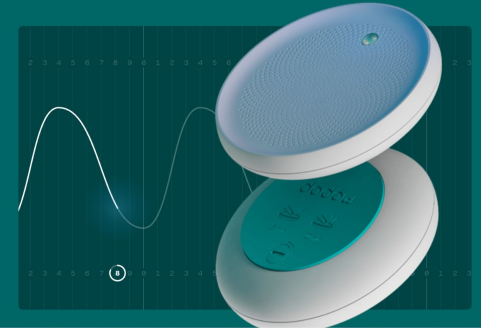
Dodow, an innovation inspired by 13,000 studies on cardiac coherence



Dr. David O'Hare
Medical doctor specializing in cardiac coherence

“Cardiac coherence is a stress and emotion management tool used, among others, by fighter jet pilots and recognized by the French cardiology federation since 2014 as one of the simplest and most effective techniques for fighting against anxiety.”

[Learn more >](#)



Seen/imagined image



fMRI activity



Feature decoder



Decoded features

Input image



Deep generator network (DGN)

Iteratively optimize image



Reconstructed image

Error



Input image features



Ethics

Positive Consequences

- More restful sleep
- Reduced fear
- Enhanced REM sleep
- Increased energy in the morning
- Opportunity to get more hours of quality sleep

Negative Consequences

- Reliance on device
- Waking of sleeping partner
- Inability to fall back asleep
- Affordability
- Where is this data about your sleep going? Is the company keeping it or selling it?

Conclusion

Should a person's natural sleep cycle be disrupted?

In what ways is it interfering with ~nature~ ?

Are we able to properly distinguish a sleep paralysis state ?

Might this device wake someone up at the wrong time?

