

Smart and Comfortable Eyewear



New smart eyewear has been developed by University of Massachusetts Amherst researchers that can track pulse and eye movement. This new technology can accurately monitor the ophthalmological and cardiac signals needed for studies on sleep quality and mental health, according to a recent study (Homayounfar et al. 2020).

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Tracking of eye movement patterns is currently done with the use of electrooculography (EOG), a technique introduced more than 50 years ago. This technique involves placing adhesive electrodes on one's face, thus causing unintended discomfort.

In contrast, the smart eyewear named Chesma provides accurate measurements of physiological signals in an everyday environment – even in prolonged periods – without compromising users' comfort.

Chesma is made of washable hydrogel electrodes, which the researchers say is a first-of-its-kind fabric-based wet electrode design that also prevents skin irritation in the wearer. Chesma, a lightweight and tailorable eye mask, provides a portable detection platform that wirelessly tracks eye motion and pulse.

In clinical practice, the researchers say, the eye mask can be used to monitor sleep. "One of the biggest classifiers between sleep stages is how radically you move your eyes," according to study lead author Trisha L. Andrew. "We could correlate some of these sleep stages and also start to understand whether you have sleep disorder problems or if you have some underlying heart rate issues."

Furthermore, Chesma, being an integrated wearable system, will enable a host of cutting-edge biomedical, psychological and psychosocial studies, the research team added.

Image credit: Homayounfar et al. 2020

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