

Student's Choice Report - LooxidVR

LooxidVR is a cutting-edge hybrid device that fuses the entertainment factor of VR with incredibly valuable cognitive research technology. Through a combination of highly advanced eye trackers and precision EEG brainwave sensors, Looxid is looking to redefine how VR experiences adapt to our minds.



[Short video explaining the LooxidVR](#)

VIRTUAL IMPACTS ON REAL MINDS

Visual stimulation has long been seen as a potential tool for rehabilitation, stress relief, and many other beneficiary health aspects. Virtual reality technology takes this to the next level with the ability to completely immerse the user in different environments aimed at specific treatment angles. Looxid Labs has created the LooxidVR in an effort to make both the research and application of this technology easier than ever before. By simultaneously observing and reacting to the data being recorded, LooxidVR is able to

create an unparalleled level of adaptive environments. At the same time, the subconscious impacts of virtual experiences are being recorded and utilized to provide more effective implementations.

HOW IT WORKS

The LooxidVR kit includes advanced eye-trackers in each lens, as well as six EEG (Electroencephalography) brainwave sensors. This provides broad coverage of the user's vitals, including pupil dilation, rapid eye movement, and emotional and mental states. The headset monitors these responses to the visual and audio content being displayed in the virtual space, which is then recorded on the connected computer which can in turn be used to dynamically modify the virtual world via the API. By interpreting the various vital responses to content, the API is able to formulate how to manipulate the content being displayed to incite different reactions and improve the experience. This is done using Looxid Lab's proprietary emotion recognition algorithm, which consists of three distinct processes:

1. Feature Extraction - Transforms data collected into categorized forms
2. Features Selection - Removes extraneous "noise" so that the integrity of the data is maintained
3. Classifier Learning - Allows the data collection algorithm to become familiar with our personal trends and responses

ENDLESS APPLICATIONS

The possible applications of this technology are extremely varied, from entertainment purposes such as dynamic gaming environments, business campaigns based on consumer's emotional feedback, and individualized therapeutic experiences. By targeting the inducers in various emotional reactions, developers can optimize virtual content to precisely treat mental trauma. Educational applications are also a possibility, providing the potential to research and utilize visual stimulation that promotes higher retention rates.

SIMILAR TECHNOLOGY

Neurable is currently researching using brainwaves to directly control a virtual avatar and its surroundings. This is focused more on utilizing brainwaves as an interfacing method, however, and less so on the potential to record and utilize emotional responses to content. It is also not a fully standalone device, as it uses a modified HTC Vive as the base platform. A partnership between Immersive Solutions and the neuromarketing research firm True Impact is aiming to provide an approach to custom marketing based on an individual's emotional responses.

ROOM FOR IMPROVEMENT

Currently, this high-level integration of VR, eye-tracking, and brainwave monitoring is extremely costly releasing at an early-bird price of \$2,400 for its first wave this summer. Samsung and Vive have already partnered with Looxid, and increased support will fuel faster development and more affordability. The learning algorithm and API are still in their testing stages, and will no doubt benefit from more widespread sampling as adoption grows. Finally, the possibility of motion sickness exists as with all VR technology (0 - 4), but the adaptive experience that LooxidVR provides could potentially alleviate this

IN CONCLUSION

This combination between virtual stimulation and real-time analysis can allow for an abundance of possibilities. While the cost-of-entry is high, this hardware is still extremely new (it was unveiled at CES 2018) and will undoubtedly become more accessible. People are already seeing the value in this approach to VR, with the LooxidVR earning awards such as Best of Innovation at CES 2018 and peaking the interest in the VR developer community. The first distribution campaign is set to begin this summer, and as adoption grows and the developers receive more data, the proprietary software will become more sophisticated and the hardware will become more affordable.

REFERENCES:

[My presentation slides](#)

[Looxid Labs Website](#)

[Engadget CES Article](#)

[Medium CES Blog](#)