Encoded Blue Eyes Project

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ABSTRACT

CONTEXT

This work presents an overview of the most recent technologies to treat blind people: the bionic eyes; whose strategy combines a retina implant with software capable to interpret the information received, process and send it to the brain. Encoded Blue Eyes Project draws attention to the use of retinal patterns processing, artificial intelligence and computing vision concept to take images then send they to the brain and a nano technological chip to process patterns from retinal equations.

PURPOSE

The main purpose of this project is to determine the barriers and most innovative strategies to restore vision using an implant that combine powerful computational resources and artificial intelligence mechanisms to properly process the images and send them directly to the brain.

APPROACH

Firstly, a bibliographical survey was carried out on the existing technologies, as well as an in-depth study of the tools to be implemented for the operation of an implant device. Projects [1], [2] and [3], have shown in different context the use of technologies that commits to bring the vision through its use. The next steps include proposing image-processing algorithms, using adaptive filters and compression methods, defining the computational aspects necessary to create a robotic device that sends the images captured directly to the brain. Once the computational aspects are defined, ensuring that they represent a greater proximity to the pattern generated by the retina will begin the research about a proposal for the use of artificial intelligence based on the use of this standard.

RESULTS

The three main projects studied represent an overview of the state of art for treatments to restore sight. We evaluated them considering their applicability, level of technology used in the processing algorithms and security aspects. The results showed out that the algorithms used are insufficient to produce data similar to the patterns expected by the brain, and, consequently, are not capable yet to restore vision and only bring a limited functional vision - the phosphenes [4]; restoring vision with greater acuity.

CONCLUSIONS

Restoring sight is a challenging goal, but also a global health demand [5]. Our project intends to, based on the work developed up to now, overcome existing barriers, creating a new processing algorithm, using an outcome artificial intelligence method and regarding security and robotic integration aspects to reach this goal.

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KEYWORDS

Bionic Eye, Blindness, Retinal Implant, Artificial Intelligence

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