Design and Implementation of an Intelligent System for Measuring Eye Movement Based on AI Technology

Auns Q. H. Al-Neam
Biomedical Engineering Department, College of Engineering, Al-Nahrain University, Baghdad, Iraq

Hind Mohammed
Biomedical Engineering Department, College of Engineering, Al-Nahrain University, Baghdad, Iraq

Lina Nasseer Bachache
Medical Instrumentation Engineering Technique, College of Technical Engineering, Al-Mashreq University, Baghdad, Iraq

Ahmed Faeq Hussain
Biomedical Engineering Department, College of Engineering, Al-Nahrain University, Baghdad, Iraq

Abstract:

Vision is one of the five essential senses in a human being, and any problem with eye movement could produce several complications in the patient's lifestyle, due to the vital importance of vision the necessary arises to design and implantation of a smart system that could predict and measure eye movement using artificial intelligent technology, the eye is a seat of a steady electric potential field that is quite unrelated to light stimulation. This field may be detected with the eye in total darkness and/or with the eyes closed. It can be described as a fixed dipole with a positive pole at the cornea and a negative pole at the retina. The magnitude of this corneoretinal potential is in the range of 0.4-1.0 mV. It is not generated by excitable tissue but, rather, is attributed to the higher metabolic rate in the retina. The polarity of this potential difference in the eyes of invertebrates is opposite to that of vertebrates. This potential difference and the rotation of the eye are the basis for a signal measured at a pair of periorbital surface electrodes. The signal is known as the electrooculogram, (EOG). It is useful in the study of eye movement.