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Last Name - Leite
First Name - Airton
Middle - Kronbauer

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Measurement of sight with psychophysical tests: study, standardization and construction of digital equipment.

Sector and University

University Federal of São Paulo - Department of Ophthalmology (UNIFESP)
University of São Paulo - São Carlos Physics Institute - Optic Group (USP-IFSC)

Authors

Airton Leite Kronbauer
Paulo Schor
Luis Alberto Vieira de Carvalho

Purpose

In ancient times there were already references of measuring the sharpness of vision

by the ability to resolve double stars. Around 1850 major changes started to happen in

ophthalmology. In 1854, Eduard von Jaeger in Vienna published a series of reading samples.

In 1861 Franciscus Cornelis Donders, professor of physiology in the Medical School of

Utrecht University, proposed a formula defining the “sharpness of vision”. First of all,

Donders defined a standard of measurement. He defined a “standard eye” as capable of

recognizing letters that are 5' high. Donders had chosen Herman Snellen as his co-worker,

who would later become his successor. Snellen introduced his letter charts in 1862.

Since then the method Donders and Snellen became the main form of measuring the

vision in ophthalmology worldwide. More than 140 years old this simple method of

measuring doesn't possess the capacity to differentiate small variations in the visual quality.

More than in previous years, the necessity of current ophthalmology practice is to quantify the

small variations in the medical procedures with the new technologies of ocular aberration

measurements. Our objective is to study, standardize and construct new digital equipment incorporating the new technologies.

Methods

A computational device that generates visual stimulus has been constructed. The visual stimulus is dynamic. The sinusoidal frequency is changeable being modified by the psychophysical response of the examined individual. The modifications of frequency and amplitude will be computed by software. The psychophysical results will be compared with objective data of ocular measurements.

Results

The study is in its intermediate phase. The project platform hasn't been totally standardized yet. Nevertheless it's possible to accomplish the first measurements of the visual quality of the eye of voluntary subjects and understand its principles.

Conclusions

With a simple idea and computerized equipment the researchers seek for creating a new and precise technique to measure visual quality.