25 Measuring visual abilities in a delightful manner

Self eye-check system using video games and tablet PCs

Abstract

We explore an enjoyable and simple way to measure functions of the eye. We combined know-hows accumulated through vision-science-experiments with technologies for drawing precise computer graphics on web browsers, and created a system for testing visual functions with a generic tablet device. Our system can be utilized for self-checking of eye functions in a delightful way like a video game. Previous tests of visual function are often time-consuming and normally require the help of medical experts. Our system allows users to measure each visual function in about 3 minutes. This system can be utilized to self-check users' eye condition routinely. In addition, by accumulating knowledge through data of many people including patients with eye diseases in simple and short-time measurement, we can expect an early detection of eye diseases, rehabilitation application, and scientific findings about complex visual processes.

Usage of vision test in various places

Symptom

Heavy

Light

None / Unaware

Consultation / examination room

- Few medical expert for one person
- High test sensitivity

Hospital waiting room

- Several medical expert for many person
- Intermediate test sensitivity

Daily

- Medical expert: absent
- Moderate test sensitivity (screening)

Reliable/ Stable assessment

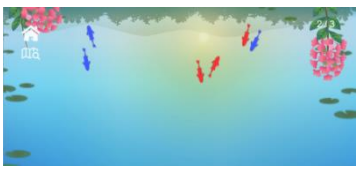
Daily self-checks

Simple tablet tests

- Easy tests with short measuring time
- Run on tablet PCs.
- Modified conventional measurement protocols.

Gamified vision tests

- Gamification with good graphical and protocol designs
- Aiming at repeated use in daily situations



References

[1] K. Hosokawa, K. Maruya, S. Nishida, "Testing a novel tool for vision experiments over the internet," *Journal of Vision*, Vol. 16, p. 967, 2016.

Contact

Kazushi Maruya Email: cs-liaison-ml at hco.ntt.co.jp

Sensory Representation Research Group, Human Information Science Laboratory

Innovative R&D by NTT

Open House 2019