

用於檢測眼球結構及功能變異的 新型多功能視覺模擬器

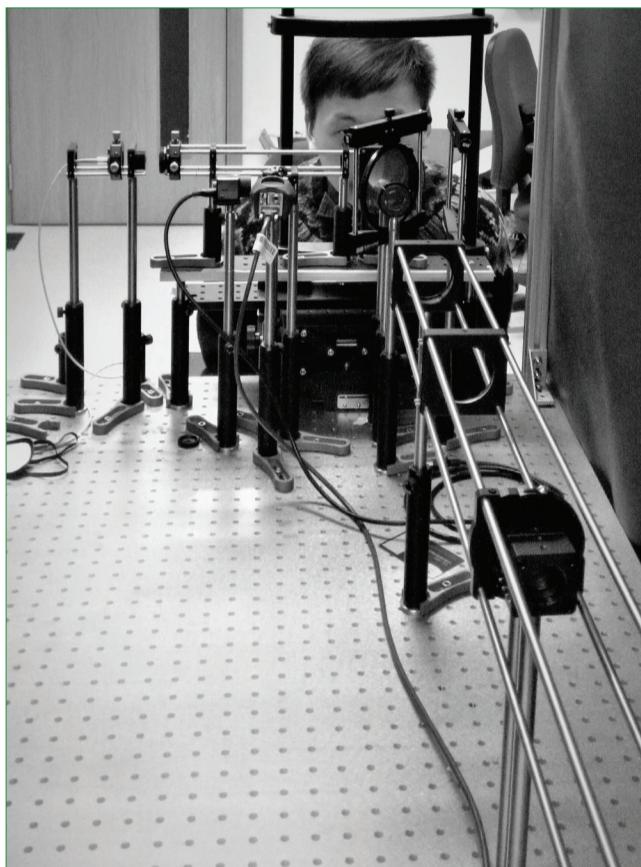
Novel Multi-functional Visual Simulator for Detecting Ocular Changes Due to Structural-functional Anomalies

投射高解像度視覺刺激以檢查視覺功能

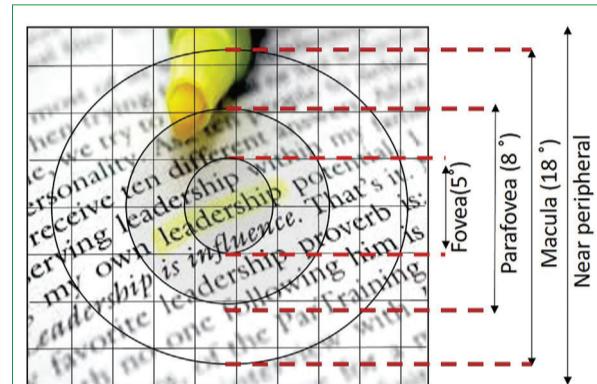
Projecting high resolution visual stimulus for the examination of visual functions

眼科醫療設備是診斷和控制眼疾的必要工具。不同的眼疾發生在眼球的不同區域，可惜目前尚未有能夠檢查眼睛局部區域結構和功能變化的設備。

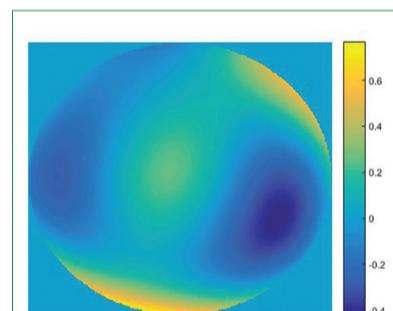
這部新型多功能視覺模擬器能在受檢者視網膜的特定區域投射影像，對眼球進行可控制的刺激，同時記錄眼睛對這些刺激的反應，從而建立受檢者的視野敏感圖，當中包括對視力、眼球運動和視網膜的分析等。所得數據有助量度視網膜各區域的結構和心理物理狀態，診斷有問題的視網膜區域，以及建立臨床策略。此視覺模擬器可緊密監測特定眼疾的變化，並在驗配處方眼科光學輔助工具時提供個人化光學參數。



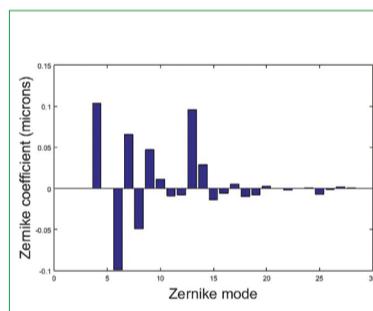
視覺模擬器的設計
The set-up of visual simulator



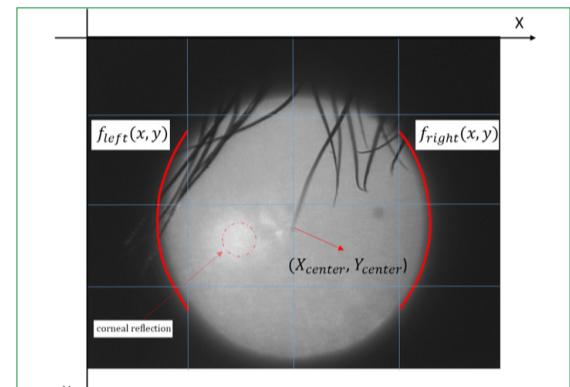
視覺模擬器對視野進行可控制的視覺刺激
Controllable visual stimuli across the visual field created by the visual simulator



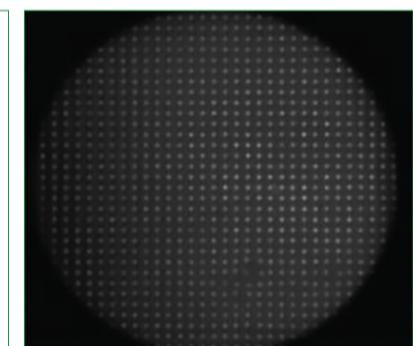
測試者眼睛光學質量的波像圖
Optical quality of the subject's eye using wavefront aberration presentation



測試者眼睛波像差的澤尼克分解圖
Zernike decomposition of a subject's wavefront aberration



測試者的瞳孔
Pupil image of the subject



從光學傳感視覺分支傳感器獲得的點陣
Spot array obtained from the optical sensors

Ophthalmic medical equipment is indispensable in the diagnosis and control of eye diseases. However, no existing equipment can monitor the changes in eye's structure and functions due to eye diseases restricted to specific region in the eyeball.

This novel visual simulator projects some images on specific regions of the subject's retina, providing controlled stimuli to the eye. Meanwhile, the device records the eye's reaction to the stimuli and creates a map of the patient's visual field sensitivity including analyses of eye acuity, eye movements and the retina. It greatly facilitates the measurement of the structural and psychophysical conditions of different regions of the eye for diagnosis of retinal regions at risk and establishment of clinical strategies. It can be used to closely monitor the progression of specific eye diseases and provide customized optical parameters when prescribing ophthalmic optical aids.

Patent Application No.: 2017106234514 (China)

Special Features and Advantages

- Multiscale visual simulation
- Combination of stimulus control and retinal tracking

Applications

- Visual function assessment for ocular pathologic conditions
- Evaluation of the effects of therapeutic intervention against ocular pathologic conditions

Principal Investigator

Dr Chea-su KEE

School of Optometry

Contact Details

Institute for Entrepreneurship

Tel: (852) 3400 2929 Fax: (852) 2333 2410 Email: pdadmin@polyu.edu.hk



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