提案人： 顏家鈺 教授

單　位： 國立臺灣大學　機械工程學系/研究所

簡　歷：

http://www.me.ntu.edu.tw/main.php?mod=adv_custom_page&func=show_page&site_id=0&page_id=202

市場及需求：

目前市售的眼壓機基本上以量測一個相當於實際眼壓的數值為主，由於眼角膜可厚可薄，這個數值可能並不準確。目前市場上已經提供了一些相關角膜厚度的指標幫助修正，但是目前仍然沒有能夠考慮角膜硬度的量測設備。本專利提供的這項量測目前正逐漸被重視，希望這個重視在短期內更被正視，成為眼壓量測的標準，則未來眼科及眼壓量測儀器都必會被這個專利規範。

技術摘要(含成果)：

提供一種角膜動態模型算法及使用該算法的系統，包括眼壓計和計算單元。 計算單元包括用於計算角膜動態模型的算法。 該算法包括：從眼壓計讀取實際的角膜變形； 將楊氏係數初始值和阻尼係數初始值代入數學方程，得到計算出的角膜變形； 確定計算的變形與實際變形之間的誤差量是否最小； 並獲得楊氏係數和阻尼係數。

優勢：

1. 全球第一個以非接觸方式找出眼角膜的軟硬度（角膜楊氏係數）。
2. 可借此判斷眼角膜的疾病,是否適合開刀。
3. 從眼角膜的軟硬度可以修正眼壓計所量測到的眼壓（此修正可達數十個百分點）。

競爭產品：

Ocular Response Analyzer (ORA)角膜韌度分析儀（目前仍採用經驗值之修正係數）

專利現況：

本專利已獲美國專利核准通知。

聯絡方式(請不用填)：

臺大產學合作總中心

Tel: 02-3366-9945,　E-mail: ntuciac@ntu.edu.tw

CORNEAL YOUNG'S MODULUS ALGORITHM AND SYSTEM USING THE SAME

PI： Prof. Jia-Yush Yen

Department of Mechanical Engineering, National Taiwan U.

Experience:

http://www.me.ntu.edu.tw/main.php?mod=adv_custom_page&func=show_page&site_id=0&page_id=202

Market Needs:

In the field of ocular pressure measurement, the instrument basically offers only an estimate of the ocular pressure. There is no distinction among thick or thin cornea. Current tonometer offers index for corneal thickness correction; however, there is no mention on corneal hardness. This can cause serious bias in the measurement. The issue is being considered in the standard committees. Eventually, the standard would require the inclusion of the Young's modules. The said patent will become the essential requirement for any tonometer.

Our Technology:

A corneal dynamic model algorithm and system using the same is provided, comprising an ophthalmotonometer and a calculating unit. The calculating unit comprised the algorithm for calculating the corneal dynamic model. The algorithm comprises: reading an actual corneal deformation from the ophthalmotonometer; substituting a young's modulus initial value and a damping coefficient initial value into a mathematical equation for getting a calculated corneal deformation; determining whether error amount between the calculated deformation and the actual deformation is a minimum or not; and getting a young's modulus and a damping coefficient.

Strength:

1. The first one use non-contact method to find the softness and hardness of the cornea in the world.
2. It can be used to determine whether the corneal disease is suitable for surgery.
3. Correct the intraocular pressure of the tonometer from the softness and hardness of the cornea. (The correction could be a few dozen percent.)

Competing Products:

Ocular Response Analyzer (ORA) (currently rely on empirical correction factors)

Intellectual Properties:

This patent has received a US patent approval notice.

Contact (do not need to fill out):

Center for Industry-Academia Cooperation, NTU

Tel: 02-3366-9945, E-mail: ntuciac@ntu.edu.tw