

附件四、技術說明表



用於心跳停止病患頭部電腦斷層之灰白質比率自動計算技術

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簡歷：(可列出相關連結，例如系所、研究室網頁)

http://www.math.ntu.edu.tw/entity_people/entity_people/21468

市場及需求：

預測心跳停止病患未來是否可以清醒對於醫療決策是重要的。準確的預測可以降低病患家屬負擔，亦可使醫院更妥善運用醫療資源。根據統計，台灣每年針對心跳停止病患大約會有 10,000 次利用本技術的需求。除此之外，凡是缺氧性腦病變患者同樣也可以利用此技術來判斷腦損傷的程度，因此使用率相當高。

技術摘要(含成果)：

此技術主要目的為協助醫師，及早準確預測心跳停止病患的預後情況。我們成功開發可以自動計算灰白質比率的方法，其為重要預後因子。結果與醫師手動計算之相關性可達 0.87，在預後預測表現上 AUROC 0.73 也比醫師手動計算灰白質比率方式 (AUROC 0.68) 更好，因此足以幫助醫師在心跳停止初期更能夠掌握病患的狀況。

優勢：

用於本技術驗證之資料集 (525 例) 在國際上屬於非常龐大之資料集，因此驗證結果更有說服力。本技術已在台大醫院進行前瞻落地測試，在產品開發進程上具有優勢。

競爭產品：

目前台灣與美國市場上尚無此類產品。

專利現況：

本技術已申請美國臨時案 (US 63/434,483)，申請日 2022 年 12 月 22 日

聯絡方式(請不用填)：

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Automatic Grey-White Matter Ratio Calculation Technique on Cardiac Arrest Patient's Brain CT

(Below is limited to 1-page only; be careful not to disclose vital technology content. Please delete these words when the document is finished)

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Market Needs:

Accurately predicting whether an out-of-hospital-cardiac-arrest (OHCA) patient will regain consciousness is critical for making informed treatment decisions. It can help ease the burden on the patient's family and ensure that medical resources are allocated appropriately. In Taiwan, it is estimated that around 10,000 OHCA patients would benefit from this predictive technique each year. Additionally, patients with Hypoxic Encephalopathy can also benefit from this technique to assess brain injuries. Therefore, the demand for this technique is high.

Our Technology:

The primary objective of this technique is to assist physicians in predicting the outcome of OHCA patients at an early stage. We have developed an automated method for calculating the grey-white matter ratio, which is a crucial factor in determining the extent of brain injury. Our experimental results reveal that the correlation coefficient between our automated method and the manual method is 0.87, indicating a strong level of correlation. Additionally, our proposed method achieves an AUROC of 0.73 in outcome prediction performance, which is higher than the manual method computed by doctors. Therefore, our technique is considered to be effective in helping physicians predict the outcome of OHCA patients.

Strength:

The validation set we used for developing this technique is significantly larger than those used in previous research studies. As a result, our experimental results are more compelling and persuasive. Moreover, the clinical validation of our technique is currently underway at NTUH, further enhancing the advantages of our product development.

Competing Products:

There are no competing products.

Intellectual Properties:

The US provisional patent has been filed (US 63/434,483) on Dec. 22, 2022.

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