
深度學習模型的比較研究 — 以 MNIST 為例

開放原始碼論文

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摘要

本論文的開放原始碼專案網址為：<https://github.com/cccresearch/nnModelCompare>

不同的神經網路模型，經訓練之後的正確率可能差異很大。本文針對手寫數字辨識的 MNIST 資料庫進行測試，以便觀察模型的表現，並分析其背後的原因。

關鍵字 神經網路 · 深度學習 · MNIST

1 簡介

近幾年深度學習技術讓人工智慧領域有了很大的進展，也吸引到了學術界與產業界共同投入研究，相繼開發出更好，但也相對更複雜的模型。

為何有些模型表現好，有些模型表現差，各個網路層的效用是甚麼，為何需要加入某些層，若拿掉的話會有甚麼不良反應嗎？這就是本研究所想要探討的問題！

2 背景

手寫數字辨識的 MNIST 是影像辨識領域中最常被拿來測試的資料集，而 CNN 卷積神經網路架構的 LeNet 則是 Yann Le Cun 1989 年在研究手寫辨識問題時，提出來的辨識模型，實驗發現 LeNet 在手寫辨識上有相當高的正確率。

不過，其他的模型，像是使用多層感知器，也可以達到 90% 以上的正確率，

[1,2] and see [3].

The documentation for `natbib` may be found at

<http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf>

Of note is the command `\citet`, which produces citations appropriate for use in inline text. For example,

`\citet{hasselmo}` investigated\dots

produces

Hasselmo, et al. (1995) investigated...

<https://www.ctan.org/pkg/booktabs>

*Use footnote for providing further information about author (webpage, alternative address)—*not* for acknowledging funding agencies.

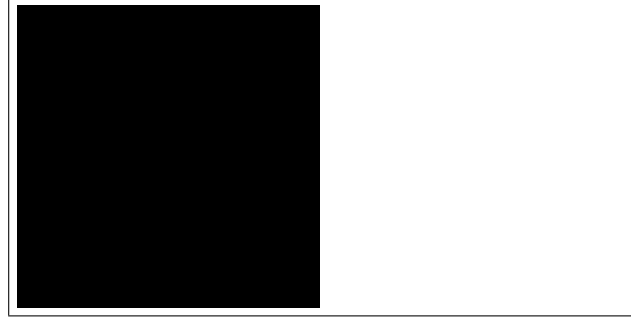


Figure 1: Sample figure caption.

Table 2: Sample table title

Part		
Name	Description	Size (μm)
Dendrite	Input terminal	~ 100
Axon	Output terminal	~ 10
Soma	Cell body	up to 10^6

4.2 Tables

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetur tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo. See awesome Table 2.

4.3 Lists

- Lorem ipsum dolor sit amet
- consectetur adipiscing elit.
- Aliquam dignissim blandit est, in dictum tortor gravida eget. In ac rutrum magna.

參考文獻

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