

范例 1: Research Article

Title : Pooling and Convolution Layer Strategy on CNN for Melanoma Detection

Keywords:

Melanoma, pooling layer, convolution layer, AlexNet, VGG, medical image classification

Abstract

Objective: Melanoma detection, CNN structure - A 同学

Method: 2 CNN model; pooling layer, convolution layer – B 同学

Result: loss 某个具体得到最好的模型 (conclusion) - C 同学

Conclusion: structure -> benefit 模型 performance - D 同学

1 Introduction

Paragraph1 (A 同学 – 300/350 words): Background: Melanoma 大体上怎样病；致死率高； -> Motivation: 提供效率，节省人力成本（帮助落后地区），更准确（compare with traditional method）

Survival Rates for Melanoma skin cancer <https://www.cancer.org/cancer/melanoma-skin-cancer/detection-diagnosis-staging/survival-rates-for-melanoma-skin-cancer-by-stage.html>

Melanoma: Statistics <https://www.cancer.net/cancer-types/melanoma/statistics> 主要前 6 段

Reference

[1] Cancer org. (2020.) Title link

Paragraph2 (D 同学 300/350 words): DL/ML 关于 Melanoma 产品

An artificial intelligence tool that can help detect melanoma <https://news.mit.edu/2021/artificial-intelligence-tool-can-help-detect-melanoma-0402> 主要简单概括用了什么模型怎么做的、仍然有的挑战

SkinVision <https://www.skinvision.com/> 介绍，怎么用怎么测，3 小点

UMSkinCheck <https://www.uofmhealth.org/patient%20and%20visitor%20guide/my-skin-check-app>

Artificial Intelligence-Based Skin Cancer Phone Apps Unreliable

<https://jamanetwork.com/journals/jama/article-abstract/2764438> 主要概括:不可靠，进而点出现有 AI-based skin cancer 诊断仍需要提高 AI 用于检测的准确性。

Paragraph3 (A 同学): CNN for image processing applied 医疗上 -> 来探讨 pooling layer 研究 contribution

The problem of AI-based melanoma diagnosis is mainly to solve an image recognition problem. Among many deep learning methods, CNNs are frequently used for image classification and recognition because of its high accuracy. 虽然已经有了 CNN 模型在医疗诊断方面的应用，但对 CNN 模型结构进行优化的研究并不多。本文将对 CNN 模型结构对 Melanoma detection 的影响。

点出本文的 contribution (C 同学): 1. This study performs Melanoma detection using CNN, including A , B. 2. Pooling layer 不同结构对结果的影响 3. Accuracy , 哪一个结构的得到了最好

Paragraph4 (D 同学): introduce article structure

2 Related work 各自段落写明论点句

Paragraph1: (350 words)

AI/DL/ML apply in cancer 诊断 - D 同学

Paragraph2: (400 words)

-image preprocessing, image classification (face recognition, writing character,...) - B 同学 (250 words)

-Melanoma + image classification - A 同学 (250 words)

Paragraph3: CNN pooling layer 应用(不只 image, 还可以对 NLP) - C 同学(350 words)

3 Methodology

3.1 Data (A 同学)

Data description <https://www.kaggle.com/c/siim-isic-melanoma-classification/data> (注意写引用) (350 words)

3.2 CNN model

(B 同学) CNN 模型更适合做 Medical image classification 这里问题。

Medical image classification with convolutional neural network

<https://ieeexplore.ieee.org/abstract/document/7064414>

+ ...

3.2.1 Pooling layer (C 同学) (300-350 words)

结构, 功能, 作用 (如果引用结构图, 一定注意图的清晰度)

3.2.2 Convolution layer (B 同学) (整段)

结构, 功能, 作用

Tips: 找 1-2 个论文设计 convolution layer

参考资料:

https://leonardoaraujosantos.gitbook.io/artificial-intelligence/machine_learning/deep_learning/pooling_layer 里面有 pooling layer 和 convolution layer

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.678.7068&rep=rep1&type=pdf> 3. Proposed mixed pooling

3.3 Experimental Design

Experiment on AlexNet and VGG separately.

4 Result:

4.1 Pooling size analysis (C 同学) (150 words)

4.2 Convolution layer analysis (B 同学) (150 words)

对上面两个部分分别进行以下分析:

- Loss, Acc table
- Dif Pooling layer : SN, SP, MCC
- comparison plots on different layer structure

表 要梳理逻辑

图 加纵坐标名字, 具体图内标题

图例子里面的 Figure 5 https://openaccess.thecvf.com/content_ECCV_2018/papers/Jongbin_Ryu_DFT-based_Transformation_Invariant_ECCV_2018_paper.pdf

5 Conclusion

Paragraph 1: Conclusion (D 同学) (300 words)

总结本研究： 1. Melanoma （看一下 Introduction 1,3 段）； 2. Melanoma detection 适用于用 CNN 来处理 + 下面参考文献;3. CNN 结构上的研究(pooling size, convolution layer, 看一下 introduction 第 3 段)

Melanoma detection by analysis of clinical images using convolutional neural network

<https://ieeexplore.ieee.org/abstract/document/7590963>

Paragraph2: Discussion (C 同学) (组织段落完整充分)

-Pooling size 更多的情况没有研究，在本研究 2, 3, 更大的： 5... (Reason/limitation: time cost 非常大) -> future work/direction: GPU. Cloud computing

-迭代次数不是最充分的，无法得到最终效果 (time cost) -> GPU

Reference

[1]

范例 2: Review Article

Title: A Survey for Pattern Recognition

Abstract:

Keywords:

1 Introduction

背景概念

Pattern (100 words) (A 同学)

定义

相关参考文献:

-R. C. Gonzalez, "Object Recognition", in *Digital image processing, 3rd ed. Pearson*, August 2008, pp. 861-909

- S. Watanabe, "Pattern Recognition: Human and Mechanical", *New York: Wiley*, 1985.

- Anil k Jain, Robert P.W Duin, "Introduction to pattern recognition", *The Oxford Companion to the Mind, Second Edition*, Oxford University Press, Oxford, UK, 2004, 698-703.

2 Pattern category (150 words) (B 同学)

具体分类

相关参考文献:

-文献 A

-文献 B

3 Pattern recognition (150-200 words) (C 同学)

应用问题, 相关应用

相关参考文献:

-

-

4 Patter recognition system (150-200 words) (D 同学)

Design model of Patter recognition system 的步骤

相关参考文献:

- M. Parasher, S. Sharma, A.K Sharma, and J.P Gupta, "Anatomy On Pattern Recognition,"*Indian Journal of Computer Science and Engineering (IJCSE)*, vol. 2, no. 3, Jun-Jul 2011.

- SeemaAsht and RajeshwarDass, "Pattern Recognition Techniques: A Review", *International Journal of Computer Science and Telecommunications*, vol. 3, issue 8, August 2012.

5 Pattern recognition models (300-350 words) (A 同学)

A. Statistical model

B. Syntactic model

C. Template matching model

D. Neural network model

6 Pattern recognition algorithms (200-250 words) (B 同学)

A. Supervised learning

解释定义，解释应用和解决的问题特点

B. Unsupervised learning

解释定义，解释应用和解决的问题特点

7 Classification algorithms (300-400 words) (C 同学+D 同学)

A. Linear discriminant analysis (LDA)

B. Quadratic discriminant analysis (QDA)

C. Maximum entropy classifier (multinomial logistic regression)

D. Decision trees

E. Kernel estimation & K-nearest neighbor

F. Naive Bayes classifier

G. Artificial Neural Networks

H. Support Vector Machine

以上每个算法需要解释定义以及具体应用，加入相应参考文献

8 Clustering algorithms (200-250 words) (A 同学)

A. Hierarchical clustering

B. K-means clustering

C. KPCA (Kernel Principle Component Analysis)

以上每个算法需要解释定义以及具体应用，加入相应参考文献

9 Conclusion (150 words) (B 同学)

概括本文研究的问题，涉及的方面分别总结小结。

References (小组成员共同整理)

[1]

[2]