Skin Lesions Classification and Prediction with Deep CNN

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Abstract: *Given the success of Deep Convolutional Neural Network in Computer Vision tasks such as image classification, object detection, etc. ,DCNN has been applied to many other fields and lays the path for new research domains. Recently, by transfer learning, Esteva et al proposed in "Dermatologist – level classification of Skin Cancer with Deep Neural Networks" that "CNN achieves performance on par with all tested experts, demonstrating an artificial intelligence capable of classifying skin cancer with a level of competence comparable to dermatologists". The results of experiments verify the intuition that features learned by pretrained models and the architectures of the DCNNs help learning features for a completely different domain dataset, here is the skin lesions dermatoscopic images dataset. Given the computational time and the test accuracy of fine-tuning the top layers and fine-tuning the whole model, for this particular dataset, I find that it's better to fine-tune the whole pretrained model with fewer epochs and less computational time and achieve better accuracy.[1].*

Keywords: Convolutional Neural Networks, Transfer Learning, Artificial Intelligence, Deep Learning.

REFERENCES

[1]. Xu, J. S. Ren, C. Liu, and J. Jia. Deep convolutional neural network for image deconvolution. In Advances in neural information processing systems, pages 1790–1798, 2014

[2]. A. Esteva, B. Kuprel, R. A. Novoa, J. Ko, S. M. Swetter, H. M. Blau, and S. Thrun. Dermatologistlevel classification of skin cancer with deep neural networks. nature, 542(7639):115–118, 2017.

[3]. A. R. Lopez, X. Giro-i Nieto, J. Burdick, and O. Marques. Skin lesion classification from dermoscopic images using deep learning techniques. In 2017 13th IASTED international conference on biomedical engineering (BioMed), pages 49–54. IEEE, 2017.

[4]. A. Rezvantalab, H. Safigholi, and S. Karimijeshni. Dermatologist level dermoscopy skin cancer classification using different deep learning convolutional neural networks algorithms. arXiv preprint arXiv:1810.10348, 2018.

[5]. X. Yuan, Z. Yang, G. Zouridakis, and N. Mullani, "SVM-based texture classification and application to early melanoma detection," in Engineering in Medicine and Biology Society (EMBS), 28th Annual International Conference on. IEEE, pp. 4775-4778, August 2006

[6]. MutasemAlsmadi, "An efficient similarity measure for Content Based Image Retrieval using memetic algorithm", Taylor and Francis, 2019

[7]. Huang, Z. Liu, L. Van Der Maaten, and K. Q. Weinberger. Densely connected convolutional networks. In Proceedings of the IEEE conference on computer vision and pattern recognition, pages 4700–4708, 2017.

[8]. Krizhevsky, I. Sutskever, and G. E. Hinton. Imagenet classification with deep convolutional neural networks. In Advances in neural information processing systems, pages 1097–1105, 2012.