

Pre-diagnosis of Skin Cancer with Artificial Neural Networks

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ABSTRACT

The Skin cancer is increasing around of world and in México is not the exception. The Skin cancer is detected from melanomas in any body part principally face, arms and hands. Therefore, we started this work for to classify the melanomas on benign and malignant. For this purpose, we used any artificial neural networks. From images database of ISIC was downloaded images and went be prepared for to train the neural network. In this work, we applied three types of neural networks.

The goal is to make a pre-diagnosis by general physician in the small clinics in México. In México there are thousands of clinics with only physician. An application could be let a physician to use the application and to make a pre-diagnosis so if it is positive the patient should canalized to specialty clinic for apply other analysis. It is possible to make an earlier detection it could save lives.

OBJETIVES

For this work we get the images from a database of melanomas images able in "https://isic-archive.com/#". This is a site that store 23906 images from collaborators of area. See the Fig. 10

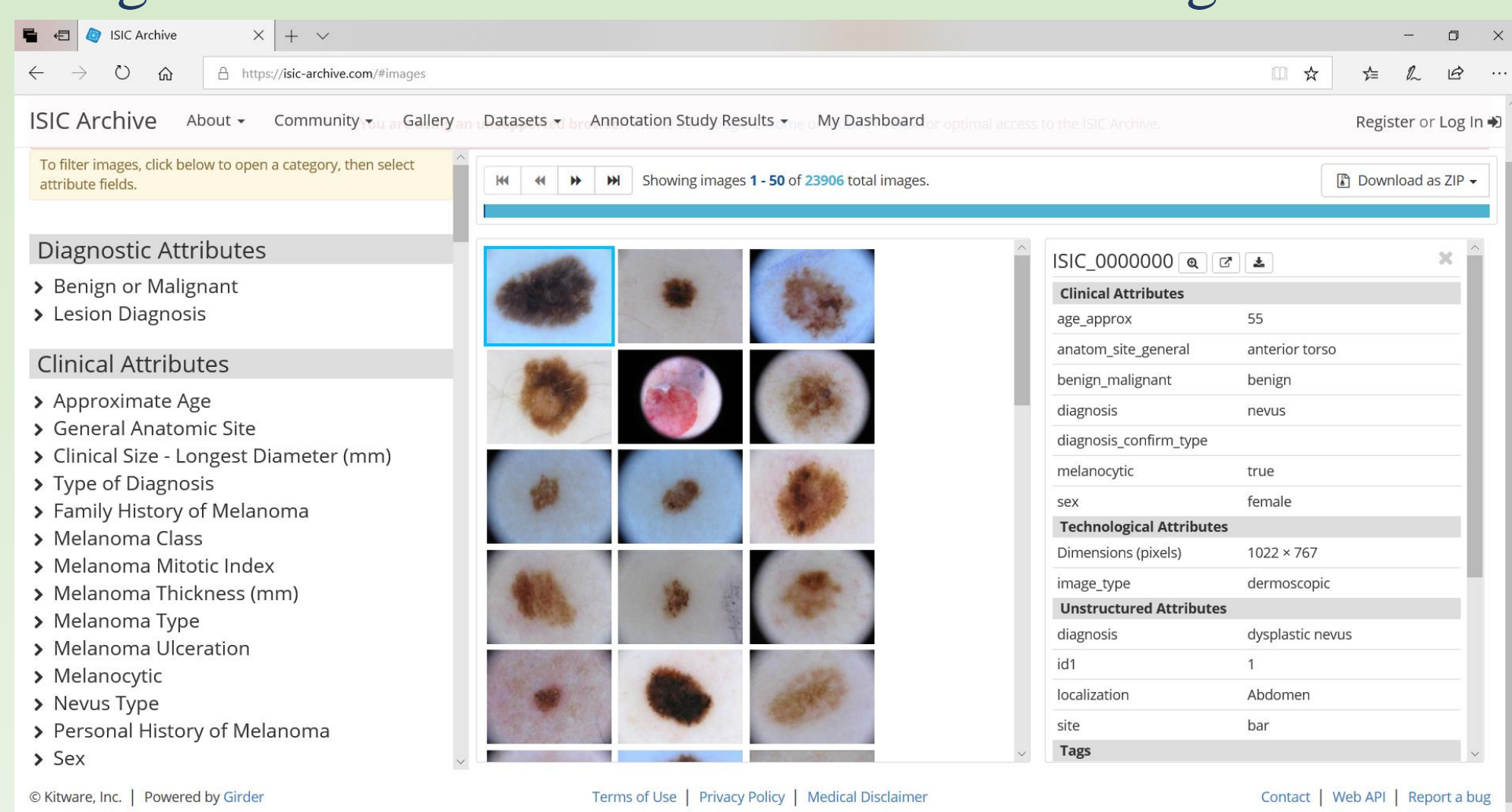


Fig. 10. Site of ISIC where are stored thousand of melanomas images with your metadata.

For this work, we made two proofs. The first with 300 and other with 200 images. We observed that with more images the results was better. Therefore, we are working with more images for a training more exhaustive and get better results. See Table 3.

Table 3. Values to classify a lesion in benign, suspicious and malignant

Algorithm	Images	Classified incorrectly	Percent	Classified correctly	Percent
Bayes	300	85	28	215	72
Tree decision	300	97	32	203	68
SVM	300	62	21	238	79
Bayes	200	69	35	131	65
Tree decision	200	66	33	134	67
SVM	200	57	20	143	80

The better result was 80%, however, we will to work for to improve this result.

CONCLUSION

Artificial neural networks can help the creation of applications for the classification of benign and malignant melanomas. An application focused on physicians of small clinics can help physicians to pre-diagnose skin cancer more accurately. When the result of the application indicates that the melanoma is suspected of being cancerous, the physician will be able to channel his patients to specialty clinics to follow up on the patient. In the research, we find tools for obtaining images, in their analysis and in some cases to do pre-diagnosis.

However, these tools are for specialists and exclusive for hospitals. We will continue working on the application and its implementation in order that it usable in small clinics where there is only one doctor. On the other hand, other types of neural networks will be explored to improve accuracy.

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