

IDS Supported Study

Human Against Machine (HAM10000)

The recent advances in artificial intelligence and image recognition and the development of convoluted artificial neural networks (CANN) challenge the role of human experts in the diagnosis of pigmented skin lesions. It has been shown that CANN reach a diagnostic accuracy similar to human experts. The current approaches, however, mainly focused on clinical images, i.e. images taken without dermatoscopy, which corresponds to examination with the unaided eye. The use of dermatoscopy has been shown to increase the diagnostic accuracy and is considered the standard of care in assessing patients with pigmented skin lesions. Dermatoscopy performed by experts is the benchmark for the diagnosis of pigmented skin lesions and the appropriate control for the evaluation of the performance of CANN

Objective: To compare the accuracy of the diagnosis of dermatoscopic images of pigmented lesions by expert human observers (dermatologists and skin cancer specialists) with the accuracy of a convoluted artificial neural network.

Design: Prospective, web-based, diagnostic study (cases will be collected before the index test) on a test set of 1500 dermatoscopy images of pigmented lesions. Each participant will rate a random sample of 25-30 lesions. The same lesions will be rated by convolutional neural networks.

Study participants: Dermatologists and skin cancer specialists (other specialist or general practitioner with a specific interest in melanoma diagnosis). Participants will be recruited via the International Dermoscopy Society (IDS), social media related to the IDS, and national dermatologic societies. Imaging communities will be invited by an international challenge to train neural networks to diagnose pigmented skin lesions. We will provide a set of dermatoscopic 10000 images to train the networks but the groups are allowed to use images from other sources for training. The three best neural networks will be selected to challenge the accuracy of human experts.

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