BACCALAUREAT GENERAL ET TECHNOLOGIQUE

EPREUVE SPECIFIQUE MENTION

« SECTION EUROPEENNE OU DE LANGUE ORIENTALE »

Académie de Nantes, binôme : Anglais/Enseignement scientifique

Thème 3 - Une histoire du vivant

Intelligence artificielle

Artificial intelligence for skin cancer diagnosis, from science-fiction to reality

Is AI going to revolutionize skin cancer diagnosis or is it going to put patients at risk?

Elaborate on the question.

Document 1: Artificial intelligence: a hot topic in many sciences, including medicine

A machine capable of making a medical diagnosis in full autonomy is fascinating and highly attractive. Giuseppe Argenziano, head of the Dermatology unit at University of Campania, Naples (Italy) envisages it for the dermatology of tomorrow. "One day, in a remote country, anywhere in the world, a general practitioner will receive a patient, notice that he has a black skin lesion, place a little machine on it and get in 10 seconds the answer if the lesion is benign or malignant. We will get there, eventually. The future is really promising, but we are not there yet".

'Machine learning' (ML), is the branch of AI devoted to the development of algorithms that attempt to simulate the human decision process. Trained with billions and billions of data points, the algorithm learns from examples and can be applied without human supervision of unseen data.

Many studies have compared the accuracy of human readers versus machine-learning algorithms for skin lesion classification. Results are amazing: state-of-the-art ML classifiers generally outperformed human experts in the diagnosis of skin lesions.

This success needs to be contextualised. "*Some of these algorithms perform better than I do, despite the fact that I have been practising for thirty years. However, this is true in the experimental setting. If you submit me an image, I perform worse than the computer. In a real-life setting, where I meet the patient and I am aware that they have hundreds of moles, or moles in a certain area of the body, or have a history of melanoma and so on, my diagnostic ability is probably better than the machine's one", Argenziano affirms.*

Vocabulary: A mole is a spot on skin.

Article adapted from Cancer World, 15 june 2020 by Elena Riboldi

Document 2: preventing skin cancer poster

Source: https://www.cancercouncil.com.au/cancer-prevention/sun-protection/preventing-skin-cancer/

Piste des attendus:

- Justifier l'application de l'AI à la dermatologie.
- A relier au nombre très important de cas en Australie.
- Comparer l'efficacité des dermatologues/personnes et de l'intelligence artificielle dans le diagnostic.

Pour la discussion, en lien avec le programme :

- Intérêt important de cette application du fait du nombre de cancer de la peau. Lien avec les mutations de l'ADN, les UV comme agent mutagène.

- Lien avec la protection moindre de l'Australie par l'ozone.

- Risque d'erreur ?

- Ethique