## *Pigmented-Skin Lesions Classifier ("PSLC")*

What's new: Using deep learning algorithms we have implemented a platform to examine patient's skin images and predict the likelihood of nine common pigmented-skin conditions. PSLC is designed to process images obtained by standard mobile devices or cameras. This last feature is a meaningful breakthrough with the highest positive impact to be observed across frontier/undeserved regions due to their lack of specialized equipment and practitioners.

Key insights: PSLC is designed to mimic the skin inspection process in an unsupervised tele-dermatology setting. It takes a patient's basic clinical profile alongside their skin images as input, returning a ranked list of likely skin conditions across nine (so-far) calibrated conditions.

How it works: Users capture basic clinical profile data and images from patients with suspected pigmented-skin conditions using a mobile app (or, a cloud-hosted tool) specifically engineered for the task. An encoding algorithm within Topazium's cloud combines images and clinical data, feeding a non-linear algorithmic framework which predicts the probability surface across each particular condition.
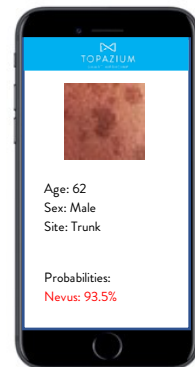
Results: PSLC classifies suspected skin conditions with similar accuracy as reported across the existing reference literature for well-trained dermatologists.

Why it matters: PSLC can assist dermatologists and general practitioners in areas with limited access to high-quality imaging equipment (e.g. dermatoscopy) delivering real-time inferences, which could accelerate critical delivery treatment's times across remote regions.

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Melanocytic nevus: a benign neoplasm composed of melanocytes.

Benign keratosis: a generic class that includes seborrheic keratoses ("senile wart"), solar lentigo - which can be regarded a flat variant of seborrheic keratosis- and lichen-planus-like keratoses, which corresponds to a seborrheic keratosis or a solar lentigo with inflammation and regression. Vascular lesions: Cherry angiomas, angiokeratomas, pyogenic granulomas. And hemorrhages are included in this category.

Dermatofibroma: a benign skin lesion regarded as either a benign proliferation or an inflammatory reaction to minimal trauma.

Basal cell carcinoma: the most common variant of epithelial skin cancer. It appears in different morphologic variants (flat, nodular, pigmented or cystic).

Intraepithelial carcinoma: includes actinic Keratoses (solar Keratoses) and Bowen's disease. These are common non-invasive, variants of squamous cell carcinoma. Actinic keratoses are more common on the face and Bowen's disease is more common on other body sites.

Squamous cell carcinoma: the second most common form of skin cancer. Untreated squamous cell carcinoma can become invasive, grow into deeper layers of skin and spread to other parts of the body.

Melanoma: a malignant neoplasm derived from melanocytes that may appear in different variants. Non-pigmented, subungual, ocular or mucosal melanoma images were excluded from the dataset.

None of the others: other non-specified pigmented skin lesions.