XIP

Classify AI

Classify AI is a software package designed to train, optimise and evaluate machine learning classifiers for automated reading of HIV Rapid Diagnostic Tests (RDTs). It compares the performance of 4 different approaches (MobileNet_v2, MobileNet_v3, ResNet50 and SVM), using a dataset of images captured in the field in rural South Africa.

Category

Software/Bioinformatics

Authors

Prof Rachel McKendry

Product Specification

Classify AI is a series of interdependent scripts written in Python 3.6.

Description

This repository contains the code used to produce the results presented in the following publication:

Deep learning of HIV field-based rapid tests DOI:10.1038/s41591-021-01384-9

The work presented is the result of a collaboration between i-sense (https://www.i-sense.org.uk/) and the Africa Health Research Institute (AHRI, https://www.ahri.org/).

The datasets are available upon request, please see details in the publication.

The repository is divided in 2 subfolders corresponding to Figures 3 and 4 of the publication, respectively.

In Figure 3, the others used a dataset of 11, 374 images of HIV RDTs captured in the field, around AHRI. They trained and optimised classifers, performed cross-validation to check for reproducibility. They produced 2 optimal classifers, one for each type of HIV RDT used in the study.

In Figure 4, the authors conducted a pilot study to assess 1) the level of agreement between participants when intepreting HIV RDTs by eye; 2) the performance of their optimal classifers (one for each type of HIV RDT used in the study) compared to traditional visual interpretation by humans.

References

1. V Turbé, C Herbst, T Mngomezulu, S Meshkinfamfard, N Dlamini, T Mhlongo, T Smit, V Cherepanova, K Shimada, J Budd, N Arsenov, S Gray, D Pillay, K Herbst, M Shahmanesh & R A. McKendry(17 June 2021) , https://doi.org/10.1038/s41591-021-01384-9, https://www.nature.com/articles/s41591-021-01384-9

Explore other available products at XIP