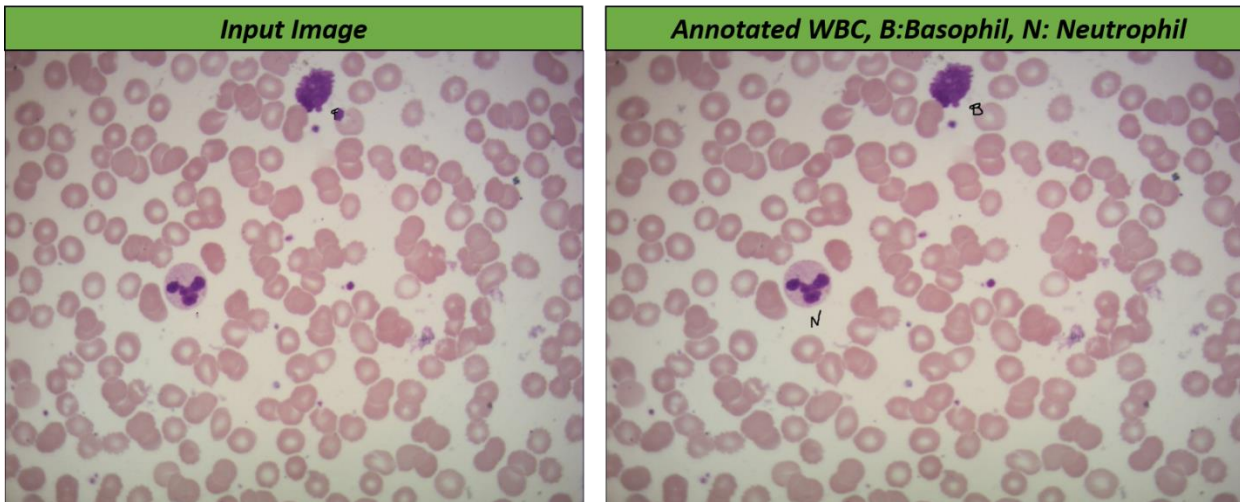
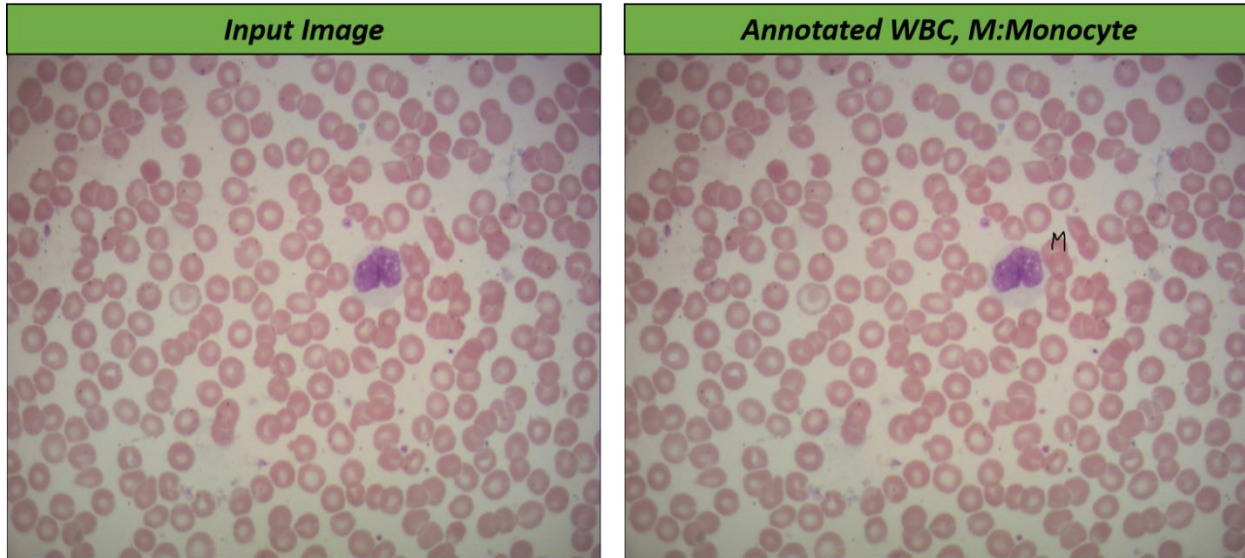


COMSYS WBCC Challenge-2022

White Blood Cell (WBC) classification challenge

Introduction

This dataset consists of annotated white blood cells (WBCs) from Leishman's stained blood slides acquired using a light microscope, OLYMPUS CX 211.



Data Description

- Images are collected from Leishman's stained blood slides on a light microscope, OLYMPUS CX 211, at 100x objective.
- Each image in our dataset has RGB channels of dimensions 1280×960 .
- There is a total of 200 images in our dataset.
- WBCs in these images belong to either of the five classes: eosinophil, basophil, neutrophil, lymphocyte, and monocyte.
- Each WBC sub-class has been annotated as either M, L, E, B, and N (M: Monocyte, L: Lymphocyte, E: Eosinophil, B: Basophil, N: Neutrophil).

- The training image folder contains 160 input images in jpg format, their annotated WBC labels, and annotations.csv file specifying the subclasses of WBC present in an image.
- A separate test folder contains 40 images whose WBCs are not labeled. The performance of each team will be evaluated on this dataset.
- The total dataset size is approximately 43.4 MB.

Significance of WBC classification

WBCs can be classified into five major subgroups: neutrophil, eosinophil, basophil, lymphocyte, and monocyte. The count of each one of them plays a crucial role in identifying a particular disease. If our body fights parasitic infections, allergies, or diseases of the spleen or central nervous system, the number of eosinophils increases. In the case of bacterial and fungal infections, the number of neutrophils increases. Basophils are mainly responsible for allergic and antigen responses by releasing chemical histamine, causing the dilation of blood vessels. The lymphocyte count increases when foreign organisms like microorganisms and antigens invade our body. Monocytes phagocytose foreign substances in the tissues. In a healthy patient, the usual distribution of neutrophils, eosinophils, basophils, lymphocytes, and monocytes are 62%, 2.3%, 0.4%, 30%, and 5.3%, respectively. If the count of these cells varies abnormally, it suggests certain abnormalities in the body.

However, prior to calculating the percentage of WBCs in blood, an automated system needs to be developed for accurate WBCs classification. Accurate WBC classification is also beneficial for diagnosing leukemia, a type of blood cancer in which abnormal WBCs in the blood rapidly proliferate, decreasing the number of normal blood cells and making the immune system vulnerable to infections.

Rules for submission

- Each team should not have more than 3 members.
- Each team should have at least one person from an Indian Institute/University/Research lab.
- Participating teams must train and validate their framework using the training images.
- The training code, trained model, and test code should be submitted for evaluation.
- The challenge organizers will evaluate the trained model on the test images.
- The performance of the trained model submitted by the teams will be evaluated using F1-Score.
- In case of a tie, an extended test set of 20 images will be used for evaluation. These images are highly challenging since they are corrupted with different outliers.
- The participating teams have to write a 2-page paper detailing the architecture of the model, training process, and the F1-score obtained on the validation set which they can generate by splitting from the training set.
- The organizers will decide on any modification of the evaluation criteria, if necessary.
- All interested teams need to register through google form https://docs.google.com/forms/d/1ALC_VMzBiKDTXjxs_Lw5iDzTP0FzZhZRRQcJnx0u32A/edit?ts=62e39896
- Participants who want to use this data for other research purpose need to agree to the terms and conditions mentioned in the google form otherwise they will not be provided with the WBCC dataset.

Timeline (Revised)

8th August 2022: **Challenge opens, the release of training data.**

~~1st September 2022~~: **Release of test data. 1st October, 2022**

~~1st October 2022~~: **Submission system opens. Each participating team must submit their training code, testing code, and the trained model. 1st November, 2022**

~~1st November 2022~~: **Challenge closes. 1st December, 2022**

~~21st November 2022~~: **Result announcement. 15th December, 2022**

Prizes

Submission of training code, testing code, the trained model, implementation details, and report is mandatory to be considered for prizes. The final decision on the winners will be made by the judges of the COMSYS WBCC Challenge-2022 and which should be final and binding.

1st place: Rs. 10,000/-

2nd place: Rs. 5,000/-

3rd place: Rs. 3,000/-

All performing teams will be invited to contribute to a 2-page paper. After compilation and editing the collection of these papers, one single manuscript describing the methods and results of the challenge will be submitted to a peer-reviewed journal.

Contact for challenge-related issues:

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