Indian Institute of Technology Madras

Web MTech Industrial AI

ID5002W: Industrial AI Lab

Assignment VII: Classification of malarial dataset

Instructions

1. Assignment shall be submitted before the due date. Late submissions will not be entertained. If you cannot submit the assignment due to some reasons, please contact the instructor by email.
2. All the assignments must be the student's own work. The students are encouraged to discuss or consult friends or classmates. However, they have to submit their own work. Any malpractice will be reported to the authorities and actions will be taken as per the IIT Madras rules.
3. If you find the solution in the book or article or on the website, please indicate the reference in the solution.

Problem

Q1 A team of researchers has collected image data of human cells [1] to predict the malarial infected cell. The file shared 'Datasets.zip' has the required data. Students must work on the folder that is named after their respective roll numbers. Each folder has two subfolders 'parasite' and 'uninfected' referring to the positive and the negative classes.

(a) Build a Convolutional Neural Network model that can predict the input image as uninfected or parasite. Note that the dataset could be highly imbalanced. (Hint: Use weighted sampling (or) weighted loss function (or) augment the dataset to generate more samples of the imbalanced class) [Marks: 8]

(b) Report the prediction accuracy, precision, recall, and F1 score in the test dataset [Marks: 2]

(c) (Optional) Try finding a similar human cell image classification model and fine-tune the model using the images shared with you and compare its performance with the model trained by you.