Design document (Final)

Page 1: Quick Project Summary

- Quick project summary
    - General Information
        - Malaria is a parasitic infection transmitted by the bite of infected female Anopheles mosquitoes.
        - A blood smear sample is collected, mixed with a reagent, and examined in the microscope. Visual criteria are used to detect malaria parasites.
        - According to WHO, in 2019, there were an estimated 229 million cases of malaria worldwide and an estimated 409 thousand deaths due to this disease. Children <5 years are the most vulnerable group, accounting for 67% (274 thousand) of all malaria deaths worldwide in 2019.
    - Project Dataset
        - The available dataset contains 5643 out of +27 thousand images taken from the blood smear workflow (when a drop of blood is taken on a glass slide) of cells that are parasitized or uninfected with malaria.
    - Link to additional information (Readme file)
    - Business requirements
        - The client is interested in a study to visually differentiate between a parasite-contained and uninfected cell.
        - The client is interested to tell whether a given cell contains malaria parasites or not.

Page 2: Cells Visualizer

- It will answer business requirements 1
    - Checkbox 1 - Difference between average and variability image
    - Checkbox 2 - Differences between average parasitized and average uninfected cells
    - Checkbox 3 - Image Montage

Page 3: Malaria Detection

- Business requirement 2 information - "The client is interested to tell whether a given cell contains malaria parasite or not."
- Link to download a set of parasite-contained and uninfected cell images for live prediction.
- User Interface with a file uploader widget. The user should upload multiple malaria cell images. It will display the image and a prediction statement, indicating if the cell is infected or not with malaria and the probability associated with this statement.
- Table with the image name and prediction results.
- Download button to download table.

Page 4: Project Hypothesis and Validation

- Block for each project hypothesis, describe the conclusion and how you validated it.

Page 5: ML Prediction Metrics

- Label Frequencies for Train, Validation, and Test Sets
- Model History - Accuracy and Losses
- Model evaluation result