Sprint 2- Project Planning

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1 PROJECT RESEARCH

1.1 Background

Coronavirus disease 2019 (Covid-19) is a contagious disease caused by a virus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Covid 19 virus is a novel virus that can cause infection in both upper respiratory tract and the lung. Over the last two years, the disease quickly spread worldwide, resulting in the Covid-19 pandemic which causes thousands and thousands of infections and death.

Chest X-ray images have proven to be powerful to monitor various lung diseases and have been used to monitor Covid 19 disease. In recent years, there is a rapid development of machine learning models. Some of which have achieved human-like performance in various classification tasks.

1.2 Justification

In current clinical practice, there is little-to-none covid detection tools based on the chest X-ray image. Developing a real-time computational covid detection tool can help alleviate patients' anxiety and improve covid early detection. This can be beneficial for the early treatment of covid 19 and also help to stop the spread of the disease.

1.3 Solution

In this project, the aim is to leverage machine learning for Covid 19 classification and display the result in an App. The App will generate results based on patients' chest X-rays in real-time.

2 TECHNICAL DESIGN

2.1 Tools/Technology

Matlab, Python, Python.tensorflow library, Python.sklearn library, Python.cv2 library, Python.Kivy library, Git, ImageJ

2.2 Data/Data Sources

Covid chest X-ray data will be downloaded from this source:

https://github.com/ieee8023/covid-chestxray-dataset

2.3 Architecture Diagram

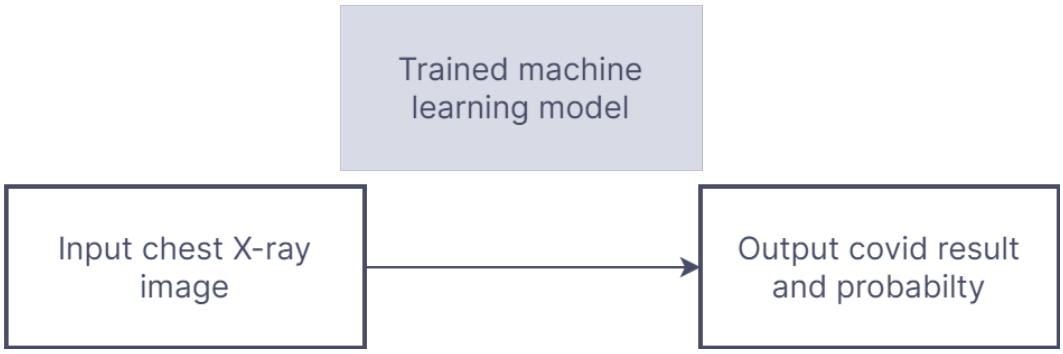

Figure 1—Architecture Diagram

2.4 Screen Mock-up

Based on the model, the output will probably also include the probability of the prediction and the models' performance information.

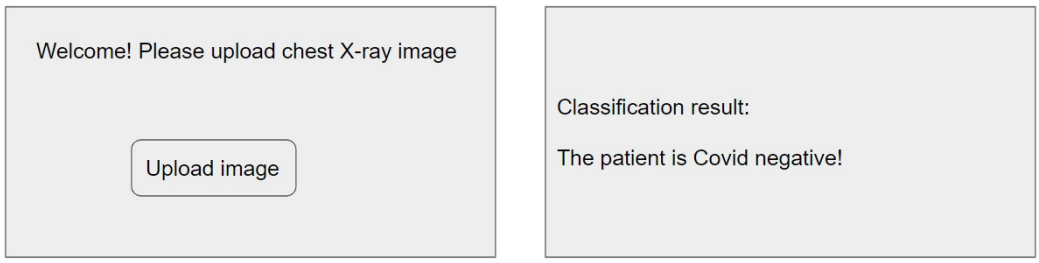

Figure 2—Screen Mock-up

3 IMPLEMENTATION PLAN

3.1 Project Task

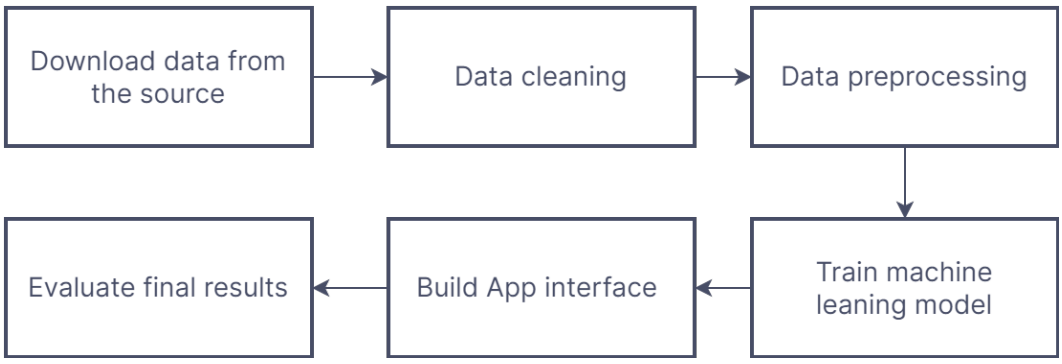

Figure 3—Project Task

3.2 Project Timeline (tentative)

Data cleaning and preprocessing will take 1-2 weeks. (10/17 - 10/30)

Then training the model will take 1-2 week.(10/31 -11/13)

And building the application and evaluating the result will take 1-2 weeks.(11/14 -11/27)

3.3 Needs/Risks

1. Cleaning the data might take extra time if there are missing labels or if I need to exclude some images for some reason.

2. Building the application might be difficult since I don't have much web development experience. I will try to get my hands on this as early as possible and look for some tutorial online.