

# A Mobile App collects and displays Daily COVID-19 and Flu Cases

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## Introduction

From Dec.2019, the covid-19 spread from Wuhan to the world. Machine learning and deep learning tech are widely used to help people to fight against this kind of new virus. The epidemic has not been controlled so far and winter has come. Therefore, anticipation and early warning of Covid-19 are necessary. This app are developed to help people away from Covid-19 seems necessary to work. We can predict the possible outbreak of the epidemic, then forecast it to the public. This technology can be also used to forecast flu. At the same time, machine learning models can be used to predict whether a person needs a flu vaccine shot or not.

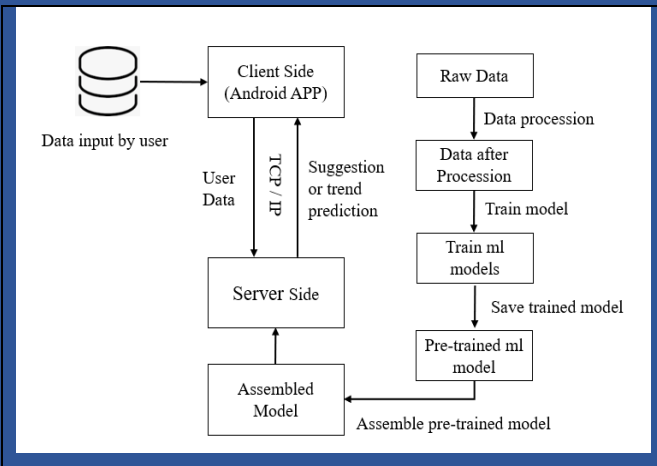


Fig. 1. Structure of Server-side and Client-Side

This app consists of client-side (android app) and server-side. Client-side. Client-side collects data from user, sends data to server-side, receives and shows the suggestion and trend prediction from server-side. Server-side uses machine learning models to calculate the trends or suggestion and sends them back to android app.

## Machine Learning

There are 3 machine learning functions of this project: covid-19 trend prediction, flu trend prediction and flu vaccine shot suggestion. These 3 functions mainly are assembled by 2~3 machine learning models, mainly include decision tree, KNN & multilayer perceptron.

The quality of regression models (covid-19 and flu trend prediction) are mainly based on R2 score, also MSE score is another important score; the quality of classification model (flu vaccine suggestion). The score are listed as follows,

COVID TREND PREDICTION SCORE

Algorithm	Score	
	R2 Score	MSE Score
Decision Tree	0.782	953.66
KNN	0.832	734.83
MLP	0.789	922.74

FLU TREND PREDICTION SCORE

Algorithm	Score	
	R2 Score	MSE Score
Decision Tree	0.763	5318.29
KNN	0.706	7250.93

FLU SUGGESTION PREDICTION SCORE

Algorithm	Score	
	F1 Score	Accuracy Score
Decision Tree	0.765	0.766
KNN	0.785	0.771
MLP	0.796	0.796

## APP Demonstration

This Android app are super easy for users. App users only need to simple steps, then he can get the trend forecast or flu vaccine shot suggestion.

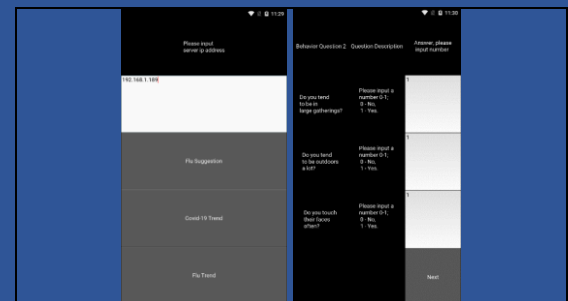


Fig. 2. Function choose Page and one of the Data input Pages

As Fig.2. shows, users only need to choose function at first page, then input some friendly data such as local policy for covid-19. Then server will calculate the data from client-side and send suggestion or prediction back. Also all data input by users will be saved and autofill the form for next