Project on own words:

Coronavirus disease 2019 (COVID-19) is a contagious dis- ease caused by SARS coronavirus 2, a virus closely related to the SARS virus. Infodemic is a term coined by World Health Organization (WHO) to explain the misinformation of virus, and it makes difficult for users to find reliable sources for any claim made on the pandemic, either on the news or social media. It is emergency to build covid19 detection system by AI. Moreover, COVID19 spread crosses all the world and various social media. Prior studies showing outstanding result of detection system by implementation of Machine learning model. However, public without background can hardly engage with complex model. To help public trust model prediction and combine with all points mentioned above. we decided to conduct a study which detect multi-lingual covid19 and explain model prediction.

Objetective 1 : Dataset Quality

As people’s activity on social media and other online platforms has been increased significantly in this pandemic situation, the misinformation provided on these platforms easily mislead the people. So, it is now a global concern to mitigate the spread of misinformation related to COVID-19 on these platforms. Therefore, a significant number of research works have already been done. However, it is observed that, there is still a lack of benchmark datasets that include resources to extract all relevant features related to COVID-19 misinformation. Besides, most of the studies have utilized the data that is mainly collected from social media platforms (e.g., Twitter, Facebook, etc.) and some other reliable sources. The majority of the datasets don’t contain data from diverse sources, countries and languages.

Objective 2 : Appropriate model

To ease the detection of misinformation, traditional ML and DL methods are widely used to build up systems that can classify misinformation more precisely. Transform is very recent technique, such as BERT. The variety of BERT is COVID19 Twitter BERT (CT-BERT), which pre-trained on large corpus of posts in twitter. We decided to test a few benchmark model to detect covid19.

Objective 3: Model Explanation

Although numerous studies has deployed state-of-art ML technique to detect COVID19  
misinformation and mostly achieved relatively high accuracy, the problem is that a  
simple model evaluation metric can not well describe most real-world tasks. And model  
interpretability is a major challenge to applications of ML methods, which has not been  
given enough attention in the field of machine learning research [38], especially COVID-  
19 misinformation detection system. Explanations are used to manage social interactions.  
By creating a shared meaning of something, the explainer influences the actions, emotions  
and beliefs of the recipient of the explanation. Therefore, it suggested that in addition to improving the performance  
of the model in task of COVID-19 infodemic, we should also improve the interpretability  
of the model so that it can improve better interaction between outstanding COVID19  
misinformation detection and public.

**Overall, summary of our research project can be seen in figure below:**

Graphical user interface, diagram, application

Description automatically generated

1. Firstly, we identified high credential fack-checking website and trustworthy  
   organisation to collect news and post relate covid19. We consider data from  
   trustworthy organisation, such as WHO, CDC, etc. is not false claim. In contrast,  
   dataset from fact-checking website have various labels, such as partial false, partial true. We keep original target labelling by different fact checker. In addition, manually  
   annotating COVID19 misinformation dataset is time-consuming, and result in  
   proportion of false news is higher than true news. As a result, we decided to add  
   additional data from AAAI2021 - COVID-19 Fake News Detection Shared Task [29],  
   CoAID, ReCOVery, FakeCovid.
2. To better understand COVID19 misinformation themsevles, we also conduct  
   explortory data analysis. Visualization is powerful way to improve communivation  
   between human and data.
3. Furthermore, Dataset also need to appropriately processing before feeding into model.  
   Model can not handle text input and several data cleaning methods are necessary. We  
   implemented tokenization, stopwords removel and filtering invaild dataset etc. More  
   details see as data preprocessing.
4. Transformer model has demonstrate outstanding performance recently. In this study,  
   we employ BERT, RoBERTa and COVID-Twitter-BERT in our dataset. Then we  
   choose model has best result, and implement model-agnostic interpretation methods  
   (i.e. SHAP and LIME) to explain what is happening within balck box model.
5. Finally, evaluation step is where we conduct qualitative analysis.