Final Project Proposal

Definitions

Team name: ***Cover Your Nose***

Team members: ***Samuel Wilkins, Shiqin Yan, Xiaoyan Zhao, Zhehui Liang***
Note: Once one person uploads the report to Gradescope, please add all other team members to the submission within the Gradescope interface (top right on your submission).

If you need to find team members, please use the 'Search for Teammates!' top-level post on Piazza—pitch an idea!

Project

Please write a one-two page document including:

- *What are the skills of the team members? Conduct a skill assessment!*

  Link to the skill assessment sheet.

- *What is your project idea?*

  We are going to develop a CV-based mobile app/website to help people check if they are wearing masks properly. Users can upload selfies of themselves to our server and get instant prompt on their screens.

  Basically this can be viewed as an object detection task plus a classification task. More details about out idea are presented in these slides.

- *What data will you use?*

  (a) Face Mask Detection dataset1 on Kaggle
  (b) Face Mask Detection dataset2 on Kaggle
  (c) Face Mask dataset on roboflow
  (d) Face Mask Detection video dataset

- *What software/hardware will you use?*

  Software: PyTorch
  Hardware: The GCP instance with GPU we created for assignment 4, and potentially Brown's compute resources

- *Who will do what?*

Name	Division of labour
Samuel	Data preprocessing, training and developing CV models
Shiqin	App developing and model deployment
Xiaoyan	CV models and Web developing
Zhehui	Data Collection, training and developing CV models

We are also going to use a task list to avoid doing the same things twice.

- *How will you know whether you have made progress? What will you measure?*

  Our workflow will be divided into two stages: creating the CV model and deploying it to cloud.

  To know whether we are making progress, several milestones can be set for these two stages. Like getting sufficient training data in the first stage, doing face recognition and the classification on types of masks that people are wearing (possibly different wearing standard for different types of masks), or finishing the front end for the app/website in the second stage.

  To test the effectiveness of our app (both in the first stage and end-to-end), we can measure the accuracy/precision of the model in the first stage, and measure the response time / the app's ability to deal with concurrency in the second stage.

- *What problems do you foresee or have?*

  – We may have problem checking whether the user is wearing mask properly if he/she uploads an underexposed or overexposed image. This underfitting or overfitting issue may be addressed by conducting data augmentations to the training images.

  – Different types of masks may look absolutely different, this might lead to a great challenge on classifying different types of masks. (Referring the following image on Kaggle

Figure 1: Different types of masks might look absolutely different!

  – Further, deploying and connecting together each component of the larger application architecture will very likely present unforseen challenges.

- *What is the socio-historical context that this project lives in? (2-3 sentences)*

  Despite the significant vaccination process, people may still need to wear masks for a long time when they are outdoors. However, currently we see many people not wearing masks in proper ways, and most of them are unconscious of this. So hopefully out project can help address this issue to to some extent.

- *Who are the stakeholders for this project? (3-4 sentences)*

  Some possible stakeholders for our project might be:

  - The individuals using our app in their daily lives;
  - Companies using this app to check whether the employees are wearing masks properly when working on-site;
  - Front line workers fighting COVID.

- *What are the benefits of a technology such as this? (2-3 sentences)*

  - From an individual's perspective, users can prevent themselves from catching COVID by properly wearing masks with the help of our app.
  - From a societal perspective, this app may help contain the spread of COVID worldwide, and potentially promote a culture that encourages conscientious mask wearing.

- *How might a bad actor misuse this technology and who would it harm? (2-3 sentences)*

  The selfies users uploaded to the app's server may be used for immoral or unethical purposes. Like generating fake images with deep fake technology and extorting people with these images. The users will be harmed in such a scenario.

- *Is there anything that we can do to help? E.G., resources, equipment.*

  Nothing we can think of for now, thanks!