Social Benefit

It is a Monday and a mother and son go to the go to mall to do some quick shopping. The mother turns her back on the child for 1 min and then turns back to see the child missing in the crowded mall. When it would normally take hours to find the child, our program applied to the security cameras of the mall can accomplish this take within mins. Furthermore, our model could be used to find missing persons/children. Along with aiding in helping to find lost children/persons, facial recognition can be used to help improve public safety. Where in with facial recognition implemented in security cameras, it would be easier to track down burglars and thieves.

Bias

Like other facial recognition models our model initial suffered from bias whereas it would struggle to recognize individuals of a darker skin tone while functioning properly with individuals of lighter skin tone. There is also potential bias in the resolution of the photos. A photo with a lower resolution may have features misidentified due to lack of information. We tried to mitigate this by resizing all images to 64 by 64 before they enter the facial recognition model. Some bias may also come from pose. If our training poses aren’t diverse enough, then the model will likely perform poorly on images where the person takes on a different stature. The same can be said for lighting and occlusion. We tried to get a diverse mix of all three of these things in our training data by having the person spin in place while the camera follows them around, panning slightly up and down. This ensures that as they face the lights of the room from a variety of angles producing a diverse dataset for the model to train on. With that our model now functions properly with individuals of all skin tone.

Safety

Given how our model is designed there are no safety concerns. Our model could cause harm by false identifying the person in the photo as someone else. We can reduce that risk by extensively training our model and consistently feeding it new data to train and test with.

Accountability

Our model is a convolutional neural network, so our input is fed through many convolutional layers, and eventually flattened out so it can be identified as one of our twenty-one classes. If problems are identified with the model, our course of action is to first check and change our inputs if necessary. Following that we’ll go through the code edit the parts of the it that is not functioning properly or is not coded correctly.

Privacy

Our model does use sensitive data as it uses and photo and name of the students within our program. The is little to no chance for the information used in our model to be exposed in any way unless our model where to be hacked by an outside source/party. The data used in the model is data that users would have shared.

Quality

Our model does generalize well to the domain to which it will be applied. To test and validate the model, we will regularly test it by taking a picture of one of our classmates and see how well it can accurately predict the person in the photo.

Principled

This model does fit into our organizations mission. One objection that we can expect to see is that someone may see this as an invasion of privacy whereas our model has a database of photos and names of University of Arkansas students and can recognized them based off a photo/video. We can explain to them that our database’s data was willingly and knowingly given to us. Along with that there is no way for anyone to just access the database and misuse the data.