1. **Introduction/Algorithm**

We managed to detect some abnormal actions in the public. Firstly, we read every picture in the video and use openpose to extract the keypoint of each person in the picture. Then we use the keypiont, NMS, and deep sort to track every person. Next, we use algorithm which is built by ourselves to predict people’s behaviors. If there is something abnormal, the system will give an alarm to the security guard.

When it comes to the algorithm to predict people’s behaviors, it is mainly based on the position change information of joint points. We managed to find typical features of different actions to design the algorithm ourselves. For example, when someone is walking, the joint points of the person will move in one direction as a whole, and the major joint points of the body will not change a lot if someone is just standing

1. **Limitation**

Our identification still has some problems and limitations. Our motion recognition judgment is based on single frame. Since there is no context before and after the event, it is not so accurate. What’s more, the algorithm is based on logic to judge actions, so it relies too much on parameter adjustment to gain a better performance. Besides, our algorithm sometimes can’t separate some similar pose, such as fight and play with friends. What we have done to recognize the actions is merely a filter. After that, these prompts will be returned to people concerned, and make the final decision.

Actually, at the beginning, we tried to build a neural network which used the information of joint points from single frame as the input to train and then formed a model to classify the action. But the result was not very good. So we tried to use RNN, but then we realized that we can not get such a huge data set to train our classifier in such a short time. Because of the lack of data, we still could not form a good model. Finally, we had to use logical method to solve the problem. In the future we will try to do a better job with better plan.

1. **Future Work**

**(1)**We will try to expand the data set, applying RNN or LSTM to make a better result.

**(2)**We will add face recognition to improve the accuracy of identification.

**(3)**We will try to do more complex classification which can predict more kinds of behavior.

1. **Usage**

Our video is in the directory called “video\_record”. There are 2 types of video in the directory. “predict separately” means the program can just predict 1 kind of abnormal behavior and we need to change the function call to predict another abnormal behavior, which performs better than “Predict all types in one time”. Use “main.py” to run the program.