Text, letter

Description automatically generated

**Problem Statement**

Primary Schools have a high priority requirement of protecting children. In the past, many children have been taken away from schools due to unauthorised adults disguising as their legal guardian. Often, these children are targeted by parental alienation where the parent is trying to kidnap their child and take them away from the other parent. As a result of such situations, primary schools are a common abduction target where the child may be picked up by someone that hasn’t been authorised for collection.

**Problem Motivation**

The problem is extremely important if we want children to stay safe at primary schools. Primary schools don’t have a good enough collection control system where children can be targeted to be picked up by people who are unauthorised. Children are easy targets and therefore it is important to keep them as safe as possible when they aren’t yet wise enough to remain safe themselves at a young age.

**Literature Review**

**INTRODUCTION**

To create the most beneficial solution to our facial recognition children collection authorisation project, we should understand facial recognition a little better. In our recent times, facial recognition has gained increasing attention. The reason why is because technology is more available than it ever has been and there are many useful things facial recognition allows us to do such as identification, access control, human-computer-interaction, etc. (Adjabi, et al., 2020). Sounds great right? Sadly, over the facial recognition history, there been complications implementing it. There are many aspects that may make it difficult to recognise faces such as lighting, facial expressions, angle of face, distance between the face and the camera (Adjabi, et al., 2020). Therefore, over the years, many different techniques have been used which has its own positives and negatives which can impact the performance and the accuracy of correctly identifying faces and that deal with these complications differently, which is why, it is important to be aware of the positives and negatives the different techniques provide. In this literature review, we will identify different solutions and the techniques they have used including their strengths and weaknesses that will help us identify the best technique for us.

**WHAT ARE EIGENFACES**

Eigenfaces are quite unique with how they do face recognition. Many techniques focus on the specific facial features that a person in the image has. On the other hand, eigenfaces doesn’t just focus on the specific features of the face although it can, it classifies the face in the image by facial patterns (Robinson, et al., 2004). Face recognition may often have problems with specific facial features such as people who have scars on their face or people have a large distance between their eyes, all of these aspects will affect the face recognition result. Now, imagine that your vision isn’t very good and what you see is blurry, the people you look at have blurry faces and it is hard to see specific unique facial features when the faces are blurry right? This is exactly what eigenfaces does, eigenfaces ignores all these specific facial features by ‘blurring’ the faces and reducing the intensity of pixels within a face just to classify a face as a face and not anything else (Robinson, et al., 2004).

FIGURE 1 – BEFORE EIGENFACE (Kshirsagar, et al., 2011)

A collage of a person's face

Description automatically generated

FIGURE 2 – AFTER EIGENFACES (Kshirsagar, et al., 2011)

A collage of a person's face

Description automatically generated with low confidence

If we look at figure 1, we can see that the faces before are normal faces which vary a little, including a person with glasses. In figure 2, we can see eigenfaces applied to those faces which completely blurs out all the faces and the pixels are no longer intense. The person who had glasses, we can’t even see that they had glasses anymore, all we can see is basic structure and shape of a face. This means that any scars, specific facial features, glasses, all of that is ignored and our output is just focused on the face itself.

**EIGENFACES STRENGTHS & WEAKNESSES**

Eigenfaces are simple, quick and easy to learn.

**FISHERFACES**

**FISHERFACES STRENGTHS & WEAKNESSES**

**LOCAL BINARY PATTERN HISTOGRAMS (LBPH)**

**LOCAL BINARY PATTERN HISTOGRAM STRENGHTS & WEAKNESSES**

**WHICH ONE IS BETTER THEORETICALLY**

**CONCLUSION TAKEAWAY FOR READER**

**Project Statement**

Based on this research, what kind of technique should we use? Why will we use this technique? What will we do exactly? – MAKE SURE TO CHANGE PROBLEM STATEMENT AS I HAVE COVERED THINGS IN THERE THAT SHOULD BE COVERED IN HERE

Adjabi, I., Ouahabi, A., Benzaoui, A. and Taleb-Ahmed, A., 2020. Past, present, and future of face recognition: A review. *Electronics*, *9*(8), p.1188.

Robinson, M.B., Escarra, M., Krueger, J. and Kochelek, D., 2004. Face Recognition using Eigenfaces.

Kshirsagar, V.P., Baviskar, M.R. and Gaikwad, M.E., 2011, March. Face recognition using Eigenfaces. In *2011 3rd International Conference on Computer Research and Development* (Vol. 2, pp. 302-306). IEEE.

[**https://ieeexplore.ieee.org/document/9215441**](https://ieeexplore.ieee.org/document/9215441)