

Feature Preserving Face Redaction of Videos in Indoor Settings

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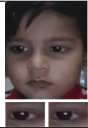
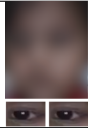

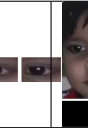


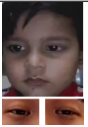
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Abstract. Analysis of mental health and development from videos is a relatively newer field in scene understanding from computer vision algorithms. A vital feature utilized for such behavioral analyses is the gaze of the subject. For instance, the so-called Preferential Looking Task and the Anti-saccade tasks [1] adopted in the Autism community track the gaze for 2-Way and 3-Way Gaze Classification, respectively. Another important feature for gauging the subject’s attention is the proximity of the face to the camera of the recording device. To this end, our team from the START Project consortium, in effect, collected a dataset of children gazing in front of a tablet and obtained “freeplay” dyadic Parent-Child Interaction (PCI) videos. These videos are recorded in an unproctored environment with inferior lighting and considerable background clutter. We preprocess and analyze further to facilitate mental health assessments.

It is imperative to preserve the identities of the subjects due to privacy concerns, which leads to the problem of Face Redaction. It is the task of hiding, in some form, the identity of one or more people present in the dataset. There are several ways in which faces can be redacted, e.g., by blurring or blackening out the region corresponding to faces, swapping the face with the face of another person, or overlaying a mesh of facial landmarks.

In this work, we propose a **Feature Preserving Redaction mechanism** that preserves important features, while at the same time, hiding the (visual) identity. We demonstrate preliminary encouraging quantitative results of *gaze classification* on redacted images using 200 videos (around 0.5 million frames) present in our curated dataset with ground truth results. We plan to release the redacted videos with ground truth to the community.

Table 1. Accuracy of 3-way classifier tuned with redacted faces

							
Scheme	No redaction	Face blurred	Face blacked	No face	Eyes blacked	Face blurred + No eyes	Dummy eyes
Accuracy (%)	96.77	96.78	96.75	97.09	74.93	51.36	75.63

References

1. Dubey, I., Brett, S., Ruta, L., Bishain, R., Chandran, S., Bhavnani, S., Belmonte, M.K., Estrin, G.L., Johnson, M., Gliga, T., Chakrabarti, B.: Quantifying preference for social stimuli in young children using two tasks on a mobile platform. PLOS ONE **17** (2022)