Face-masked Face Blurring App

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Face-masked face blurring application is a tool to protect participants' privacy by anonymising faces in an image or video when creating a new dataset. Deep learning and neural network models require a vast training dataset for training. However, a dataset containing sensitive data must be anonymised before releasing it to the public to avoid legal issues. The dissertation focuses on developing a solution to blur face-masked faces in a massive set of video footage containing children wearing face masks performing various activities. The proposed design is a three-stage process involving face detection, facial landmark localisation and blurring. The experiments involve comparing feature extractors such as ResNet50, VGG16, and MobileNetV3 for the Faster R-CNN to detect face-masked faces, training loss function for ResNet18 CNN facial landmark localisation and different Gaussian kernel sizes of blurring. The models were trained using a public JD-landmark-mask dataset containing face-masked faces, bounding box and landmarks annotation. The approach uses transfer learning principles to train the models on a different dataset and is used on the new children's dataset. The ResNet50 Faster R-CNN model with custom Region Proposal Head (RPN) hyper-parameters trained with 30 epochs were selected with a mAP@Iou[0.5:0.9] score of 0.492. The ResNet18 CNN model was able to detect facial features with the presence of face masks with an L2 loss of 12.0285 after 100 epochs. The feature-based blurring obfuscated the faces while maintaining data utility of the face region, enabling future models to detect face and facial features. The results are promising, and the modular design enables switching each stage with different techniques to fit new applications.