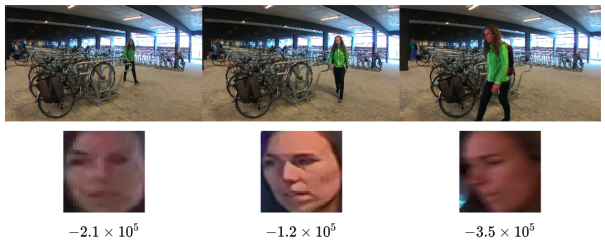

Figure 9: Three frames from the footage of a security camera in a bicycle parking lot. The corresponding frame crops and quality scores are depicted below each frame.

and is able to assign useful scores to each crop.

7 Conclusion and future work

In this study, a novel face image quality assessment method is proposed based on a variational autoencoder's reconstruction probability. This is, by our knowledge, the first time a generative model like a VAE is used to tackle the problem of face image quality assessment. We demonstrate, by quantitative and qualitative results, that our method can be used as a biometric quality predictor. Unlike other data driven approaches, no facial recognition model is used for training and no explicit definition of face quality is given. Our FQA algorithm is used as a building block in a privacy-friendly alternative to large scale facial recognition. Instead of identifying all detected faces in a video stream, our system saves one high quality face crop without revealing the person's identity. This face crop is encrypted and access is only granted after legal authorization. In such a way, the system still supports criminal investigations while not violating the proportionality principle.

In future work, we will further optimize the VAE architecture keeping the constraints on model size and computational complexity in mind as the final goal would be to deploy the model on a stand-alone edge device. It would be interesting to investigate different hardware platforms such as FPGAs that allow the model to process data in real-time with a small energy consumption, making it possible to embed our system in low cost surveillance camera's. Moreover, our method should be evaluated on other datasets and in combination with alternative feature extractors.

8 Acknowledgments

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