# Generalizable Facial Presentation Attack Detection Based on the Analysis of Facial Regions(2023)


## ABSTRACT

Advancements in deep learning have significantly improved presentation attack detection (PAD) systems, achieving high accuracy across various realistic conditions. However, most existing methods rely on analyzing the entire face, overlooking the fact that artefacts used in spoofing attacks can appear in different facial regions depending on the type of attack instrument, the individual subject, and environmental factors. Moreover, these systems often struggle to correctly identify genuine users who unintentionally occlude parts of their face with accessories like glasses, scarves, or masks, especially in health-related scenarios. This work addresses these limitations by investigating the effectiveness of individual facial regions for PAD. A novel metric called Face Region Utility is introduced to evaluate how well a specific facial region can detect attacks when trained on a different region. Extensive testing on standard PAD databases under challenging conditions reveals that certain regions can effectively replace full-face analysis. Notably, the proposed approach improves detection performance by up to 67.73% when genuine users wear protective masks, demonstrating its potential to enhance PAD reliability in real-world situations.