A Hybrid RGB+Thermal Camera for Privacy Preserved Computer Vision Applications

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OVERVIEW

Detection and removal of personally identifiable information (PII) from surveillance camera videos

- Combines evaluation of red, green, and blue (RGB) lights with thermal imaging
- Able to completely remove PII and work in concert with computer vision (CV) methodologies

BACKGROUND

The increased use of surveillance cameras to monitor areas and enhance security has led to inadvertent capture of personally identifiable information (PII) compromising individuals' privacy. These concerns are significant for recordings made in crowded urban environments, and they limit the use of cameras in privacy-sensitive settings such as the home, workplace, and hospitals. The details about when the PII removal occurs, and under whose direction, are important factors to address when attempting to maximize the moral and legal aspects of the process. The removal of PII before storage is important to minimize the potential damage of data breaches. Still, manual identification and redaction of PII proves time-consuming and prone to errors, while automated systems can result in false positives or negatives. And, the commonly employed pixelation or blurring of sensitive data offered by existing systems can be reversed by available image processing and artificial intelligence. So, a need exists for improved methods to detect and remove PII from images captured by surveillance cameras.

INNOVATION

Researchers have created a method that proposes pairing the evaluation of red, green, and blue (RGB) lights with thermal imaging to robustly detect and remove personally identifiable information (PII). The technology is capable of removing PII such as facial patterns, skin color, gender, body shape, and more before the images are stored or transferred from the device. This RGB Thermal camera contains an embedded graphics processing unit (GPU) capable of performing real-time privacy sanitization tasks at 8 frames per second (FPS) while using less than 5 watts of power. The device may function in its most fail safe setting to completely remove all PII, though a more permissive setting maintains full compatibility with downstream computer vision (CV) methods to successfully sanitize 99% of faces. This innovation facilitates privacy-preserved exercise tracking, in-home active inferencing, and fall detection. The technology therefore improves privacy during acquisition of surveillance camera videos in the public and private setting.

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Author(s)
Alanson Sample
Yasha Iravantchi

Further information
Joohee Kim
jooheek@umich.edu

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