

ABSTRACT

Smoking is one of the leading causes of death globally, with more than 8 million deaths each year, including 1.3 million from exposure to secondhand smoke. Telkom University has established a smoke-free area policy to create a healthy campus environment. However, the implementation of this policy faces challenges, especially in monitoring violations in campus areas with minimal direct supervision, such as emergency stairs, basements, and toilets. This study aims to develop a web monitoring system based on Computer Vision technology that can detect smoking and vape violations in real-time. This system uses semantic segmentation with DeepLabv3 architecture and MobileNetV3 backbone, optimized using Youden's J statistic and G-Mean to improve detection accuracy. Multi-function surveillance cameras are used to analyze the distribution patterns of cigarette and vape smoke, which are then integrated into the web monitoring. With an Agile approach, development is carried out iteratively to ensure the system meets user needs. The results of the study are expected to be able to increase the effectiveness of enforcing the smoke-free area policy and create a cleaner, healthier, and more conducive campus environment.

Keywords: *Smoking, Smoke-Free Area, Computer Vision, Semantic Segmentation, DeepLabv3, Web Monitoring.*