SafeguardNet: Enhancing Corporate Safety via Tailored Deep Transfer Learning for Threat Recognition

Abstract:

SafeguardNet is a deep transfer learning-based model designed to improve corporate safety through multiclass threat detection. It can identify multiple threats, including knives, guns, fires, and normal scenarios, unlike traditional systems that focus on detecting a single threat type.

Using the Xception architecture, the model achieves 94.5% accuracy, 92.3% precision, 93.8% recall, and an F1-score of 93.0%. It performs particularly well with F1-scores of 96% for guns and fires, 95% for knives, and 89% for normal scenarios. The model's high performance is attributed to training on a diverse dataset, enhancing its ability to distinguish between different threats.

This diverse data improves accuracy and reliability, making SafeguardNet a robust solution for real-world corporate security. It provides comprehensive threat detection and sets a new benchmark for modern safety systems.