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Face Detection Using Machine Learning

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Abstract: *Face Detection plays an essential part in numerous operation exertion including facial identification, security systems, and commerce between people and computers. The prospect of face detection using machine learning shall be explored with main methodologies, which include the use of Haar cascades, CNNs, and SVMs. When comparing the methods, the study focuses on their performance within these criteria of accuracy, computational complexity, and reliability. The experimental findings show that CNNs have better accuracy, achieving high stability of results regardless of the conditions for classification. Also, the study discusses the applicability of these techniques to practical problems, the complexity and time required to execute methods, how the approaches can be scaled up and down depending on the problem's characteristics. The results indicate that although different approaches like Haar falls are effective for the problem, they fail in more complicated and ever- changing surroundings. That is why, despite the fact that CNNs require greater computational resources, modern face detection systems are based on them due to their accuracy and versatility.*

Keywords: Ethical hacking, Cyber defense, Isolation Forest, Anomaly detection, Machine learning

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