Liar Liar Pants on Fire: A Computer Vision Approach to Deception Detection

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Lie detection has been a subject of interest due to the severe repercussions that false statements can have on society, particularly in high-stakes situations such as courtroom hearings and police investigations. The potential harm from a false testimony is significant and could lead to an innocent person being convicted and incarcerated while allowing a guilty person to be freed. The goal of this research project is to develop a highly successful and non-intrusive model to be used in the determination of lies in high-stakes situations. Existing approaches focus on combining the visual, audio, and transcript modalities and mainly utilise the court dataset. With the advancement of computer vision and machine learning algorithms, a visual approach to lie detection is possible where facial characteristics are used as input features to train the model. The model uses a stacking ensemble, consisting of Random Forest, XGBoost, and a Neural Network as base classifiers and a Random Forest as the meta classifier. Despite only using the visual aspect of the video, it managed to achieve an accuracy of 86.96% and AUC of 0.844 on the court dataset and an accuracy of 80.00% and AUC of 0.761 on a novel politician dataset. This is a marked improvement compared to most of the existing work and goes to show that an ensemble method may be more a successful method to address this problem, diminishing the need to obtain audio and transcript modalities.

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