FACE LIVENESS DETECTION FOR ANTISPOOFING

INTRODUCTION

Liveness Detection System provides a method to detect spoofing attacks using pictures, video sequences and paper masks. This will improve the user authentication in security systems and provide a convenient and safe environment for organizations with critical data.

BACKGROUND

	EYE MOVEMENT	FACE MOVEMENT	FACE TEXTURE	BLOOD FLOW
Type	Active	Active	Passive	Passive
Spoof	2D	2D	3D	3D
Spoofing Difficulty	1			5

RESULTS

	TEXTURE ALGORITHM	BLOOD FLOW ALGORITHM
REAL	75.037%	96.666%
FAKE	87.581%	73.333%

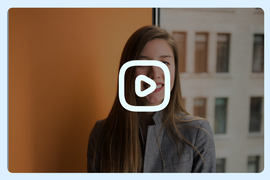
REFERENCES

Z. Boulkenafet, J. Komulainen, and A. Hadid, “face anti-spoofing based on color texture analysis,”, [Online]. Available: http://arxiv.org/abs/1511.06316

1. De Haan, G., & Jeanne, V. (2013). Robust pulse rate from chrominance-based rPPG. IEEE Transactions on Biomedical Engineering, 60(10), 2878–2886. https://doi.org/10.1109/TBME.2013.2266196

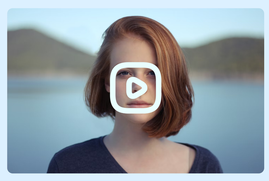
METHODOLOGY

DATASET



Data Collection → Frame Extraction → Face Detection → Crop and Resize → Labeling (Positive and Negative) → Processed Dataset

EYEBALL MOVEMENT



Input → Face and Landmark Detection → Determine Iris Position → Output

TEXTURE ANALYSIS

Input Image → Image Space Color Conversion (Y, Cb, Cr) → LBP Histograms → Concatenation of Histograms → CLASSIFIER → Real / Fake

BLOODFLOW ANALYSIS

INPUT IMAGE → NORMALIZED IMAGE → FACE COLOR MEASUREMENT (Mean Colors in RGB) → CHROMINANCE METHOD (RESAMPLE MEAN COLORS; BANDPASS FILTERING; CALCULATE CHROMINANCE COMPONENTS) → PULSE RATE ESTIMATION (BPM AND SNR) → REAL / FAKE

TECHNOLOGIES

TEAM MEMBERS

RIMSHA MIRZA

EMAAN BASHIR

AROOBA SIDDIQI

ADVISOR

Dr. Seemab Latif

COADVISOR

Dr. Syed Imran Ali