Scope
Database
Indexed
www.sdbindex.com

# An Efficient Velocity Estimation Approach for Face Liveness Detection using Sparse Optical Flow Technique

N Nanthin [1]* N.Puviarasan [2] P.Aruna [3]

[1] Research scholar, Department of CSE, Annamalai University, Annamalai Nagar, Chidambaram, India.

[2] Department of Computer and Information Science, Annamalai University, Annamalai Nagar, Chidambaram, India.

[3] Department of Computer Science and Engineering, Annamalai University, Annamalai Nagar, Chidambaram, India.

## Abstract

*Objectives: To propose a new liveness detection algorithm using optical flow to ensure the presence of actual live face into a photograph or 2D masks in face recognition biometric security systems.*

*Methods: This work proposes an antispoofing model namely Sparse Optical Flow Technique with Velocity Estimation Approach (SOFT_VEA). Optical flow is an effective method for tracking objects in motion. It is adapted in this work to capture facial movements and decide the liveness state. The proposed algorithm considers real faces and two kinds of photo imposters.*

*Findings: From the input video, the motion information of specific facial landmark points is captured by an optical flow algorithm. Then, the velocity of those landmark points is estimated via Euclidean distance. Based on this calculated velocity, the fake face is discriminated from the real face using a threshold value. The Empirical study shows that the proposed face liveness detection model is effective with an accuracy of 88% and Half Total Error Rate (HTER) of 2.45.*

*Novelty: The proposed work is based on real face and photo imposters. The liveness detection algorithm is developed with a novel velocity estimation approach. It is very helpful for biometric security systems.*

## Author Keywords

Biometric Security System, Liveness Detection, Antispoofing, Facial Landmarks, Optical flow, Euclidean Distance

## Reference