

Facial Liveness Testing: For The Web

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Abstract —

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I INTRODUCTION

Currently, username and password authentication is commonplace throughout the web. However, username and password based authentication systems have a number of problems. Some common passwords can be broken using dictionary attacks, especially if they consist partially or entirely of a word in a standard dictionary. Furthermore, the process of shoulder surfing is possible (watching out for someone's password, and how they type it).

An easy to use system is necessary to remove the choice from the user (in terms of password), relying on the user being automatically detected, and several confirmation methods to ensure the user is indeed who they say they are (and not just someone spoofing the system). Before such a system is developed, a facial liveness testing method must be found that operated in near real-time, and that is fairly accurate.

II RELATED WORK

TODO related Work

III SOLUTION

A A system for preventing 3D spoofing attacks

While the systems before might go partially towards preventing 3D spoofing attacks, we now propose a method that is designed for classifying facial liveness based on a 3D point cloud.

A.1 Point Cloud Reconstruction

In order to classify an image/video, a 3D point cloud needs to be created, containing many 3D points (x, y, z) of a user's face. While 3d reconstruction is easier with videos (using structure from motion or other multiview based methods), there also exist image-based reconstruction methods such as **vrn** **CITE VRN network model here for 3d reconstruction**, which are more specific and designed for reconstructing faces based on images.

A.2 3D point cloud classification

Once the 3D reconstruction is obtained, one can then classify this using some model to produce the fake/real metric.

For points, PointNet is a model that can be used **EXPLAIN POINTNET**

However, as we are using voxels, there is a more specialised architecture called Voxnet that is designed for classifying 3d volume-based objects. This is the model used here.

IV RESULTS

TODO results

V EVALUATION

TODO evaluation

VI CONCLUSIONS

References