



## LIPSECURE BY LIOPA: UNRIVALED BIOMETRIC LIVENESS DETECTION

LipSecure prevents Authentication spoofing using A.I. based lip reading. Automated visual speech recognition is applied to videos of a user speaking to validate that a live person is present during an on line transaction.

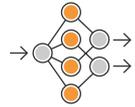


### LIPSECURE IN USE



#### Capture

During a secure on line transaction in which spoofing is a threat the LipSecure client, which can be integrated into any mobile application, takes a selfie video of the user saying a random sequence of digits generated by the LipSecure cloud service.



#### Recognize

The selfie video is sent to the LipSecure cloud for analysis. The video is checked for authenticity (replay attacks, splicing etc.). Image based features are then extracted and fed into a Deep Neural Network (DNN) which contains a pretrained model.



#### Confirm

The output of the DNN, which is a probabilistic representation of what the user said, is analysed to assess correctness in comparison to the random sequence. This is then processed by a proprietary Confidence algorithm to give a Liveness Decision.

### LIPSECURE KEY FEATURES

Confidence Score	Min. FAR (%)	Confidence Score
0	0.05	
43		
60		
69		
75	0.003	
82		
88		
94		
100	0.000...	

#### Fast Liveness Checking

LipSecure captures & analyses the user video and returns a result to the mobile App within a few seconds

#### Highly Accurate

LipSecure Visual Speech Recognition engine is an advanced & highly accurate Deep Neural Net

#### No Enrollment Required

The LipSecure Deep Neural Network is speaker independent - therefore users do not need to enrol

#### Works On Any Device

LipSecure utilises any front facing camera available and so can be used on any mobile device or laptop

#### Superior Usability

The LipSecure App flow is quick and very simple to use. Intelligent feedback ensures minimum retries.

#### Cross Platform Integration

LipSecure is a cloud based service which is made available as an easy to integrate and secure REST API

# VSR TECHNOLOGY

The Liopa Visual Speech Recognition (VSR) technology is based on the principle of Viseme analysis. A viseme is a unique lip movement that can be used to describe a specific sound. A viseme is the visual equivalent of a phoneme or unit of sound in spoken language. Using visemes, the hearing-impaired can view sounds visually via studying a person's lip movement. Liopa's A.I. based VSR technology implements this process programmatically by:

- Capturing a video of a subject speaking
- Tracking & extracting the movement of the subject's lips
- Performing lip movement feature extraction
- Using Deep Neural Network (DNN) techniques to analyse features extracted from each frame of the video
- Comparing the results of the analysis (on a viseme by viseme basis) with a universal model to determine what has been spoken.

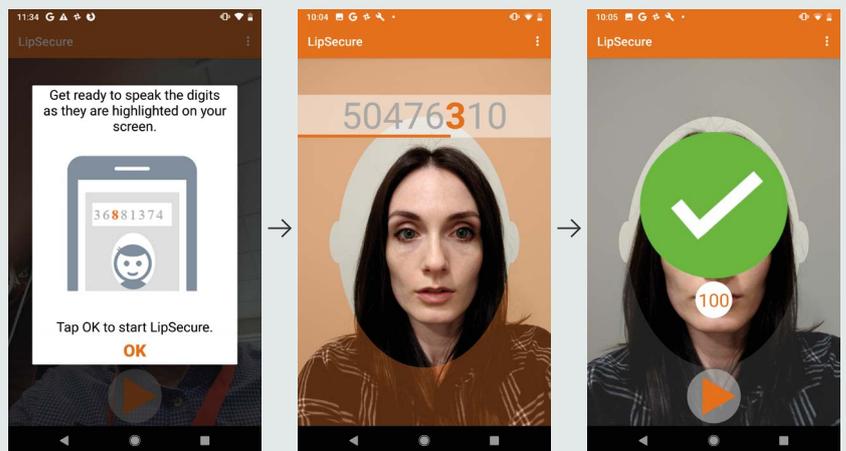
A deep neural network (DNN) is an artificial neural network (ANN) with multiple hidden layers between the input and output layers giving the potential of modelling complex data with fewer units than a similarly performing shallow network. Liopa has developed a DNN based VSR system which leverages a proprietary and patent pending combination of leading edge neural network techniques.

# LIPSECURE USER JOURNEY

The LipSecure liveness check is implemented via a simple and fast mobile App user interaction. This capability can be very easily incorporated into any mobile App workflow via the LipSecure SDK.

When the workflow is invoked the user is guided to place their face in the middle of the screen and instructed to repeat a random code which is presented on the screen.

A video is captured, sent to the LipSecure cloud service, analysed for authenticity and a Go/NoGo decision returned.



# USE CASES



## Biometric Authentication

Biometrics use an individual's unique biological identifiers to verify identity. In unsupervised authentication situations liveness detection is required to determine the user's presence.

## Identity Verification

It is critical to ensure liveness of users who provide information that is associated with the identity of a real person during verification of the authenticity of physical identity documents etc.

## Secure Online Transactions

The security of online transactions, such as e-commerce & m-commerce purchases, is assured via various authentication methods which are open to spoofing if not combine with strong liveness checking

## Convenient Mobile Captcha

Captcha is a common test applied during many on line interactions to ensure that a human is present. LipSecure provides a quick and convenient alternative to existing Captcha methods.