TECH OFFER

Face Anti-Spoofing Technology

KEY INFORMATION

TECHNOLOGY CATEGORY:
Electronics - Embedded Systems
Electronics - Sensors & Instrumentation
Infocomm - Big Data, Data Analytics, Data Mining & Data Visualisation
Infocomm - Security & Privacy

TECHNOLOGY READINESS LEVEL (TRL): TRL4
COUNTRY: SINGAPORE
ID NUMBER: TO174805

OVERVIEW

Face anti-spoofing (FAS) has recently drawn increasing demand as one of the critical technologies for reliable and safe authentication systems to prevent fraudulent operations. Traditional FAS approaches become unreliable when more and more realistic presentation techniques emerge. An artificial object like a photo, video, mask, or other substitute that imitates the unique biological properties of a person is presented to the biometric scanner.

Biological determination technology identifies physical traits as well as social and psychological conditions to determine the authenticity of a unique living person. Liveness detection is defined as biometric detection that can discriminate between the features of live skin and copies of those features in a fraction of a second. However, as every man-made solution can be defeated, efforts to enhance and improve liveness detection always remain a work in progress.

This technology offer is an identification method which can prevent spoofing more robustly by providing multiple biological determination processes in an arbitrary order determined by the system. Thus, the probability of correctly guessing a unique pattern for performing biometric determination actions decreases exponentially, preventing the preparation of authentication presentation actions beforehand.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology prevents anti-spoofing by engaging the user in a few tasks. The system will instruct the user to follow through with a few sets of biological determination action items. During which the system captures face images at a predetermined frame rate to validate the expected outcome.

The biological determination action includes:

- Face orientation
- Eye orientation
- Opening and closing state of eyes
- Opening and closing state of mouth
- Wearing and removing of spectacles
- Wearing and removing of masks

The system can also include fake object detection by analysing the outer frame of the subject, e.g., photograph's outer frame that is not matching the rest of the background.

Two or more biological determination factors can be selected randomly from multiple actions; in pre-defined or random order and validated based on the images captured during the process. In this case, the patterns for performing the actions increase exponentially by adjusting the number, content and execution order. This prevents the users from being able to prepare any artificial mode of authentication material in advance.

POTENTIAL APPLICATIONS

This technology offer can be adopted by software/application/system developers providing personal authentication functions, and potentially applied to the following systems:

- Applications running on smartphones or computers - eKYC (electronic Know Your Customer))
- Entrance control system
- Digital banking biometric verification (2FA)
- Social media/gaming/dating profile verification

UNIQUE VALUE PROPOSITION

This technology enables identification service providers the opportunity to further improve countermeasures against identity fraud using biometric liveness detection.

Compared to other anti-spoofing methodologies, this technology may provide more secure countermeasures by a combination of multiple biological determination processes as well as fake determination functions.

The technology owner is interested in licensing to software /application developers providing facial authentication functions in various industries, e.g., access control, digital banking, social media profile, etc.