Cyprus International University

Faculty of engineering

Department of Software Engineering

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Masked Face Recognition System (MFR)

Proposal

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1.0 Statement of purpose

When the Corona pandemic began to spread, governments issued laws requiring people to wear masks in public places, and this led to problems in face recognition systems, Where the systems can no longer identify the user' s identity, which led to the suspension of all these systems, whether public facial recognition systems such as systems for opening and closing doors or personal systems such as Face ID in iPhone devices.

On the other hand, facial recognition systems in public places that are used in countries such as China, as these countries follow a political pattern, they track the movements of citizens through artificial intelligence systems that analyze and track the movements and actions of citizens and issue violations or orders to arrest or give rewards to citizens according to their behavior in public places and this system are based on the face recognition.

So, we decided to find a solution to this problem by creating a masked facial recognition system, where it makes it easier for people to use security systems. It is also based on the principle of (touchless) where you do not have to touch the device like fingerprint systems.

2.0 Company Information

Masked Face Recognition system – MFR project needs two types of work, hardware and software, the company employees are four persons so the team will be divided one of them for the hardware side and three of them for the software side.

Ahmad Jawabreh: Smart contract development, blockchain bridges, Dealing with the blockchain services providers and Database creation.

Zaid Mohtaseb: Software Development for the RFID system & MFR system.

Rahaf Ismail: Responsible to connect the hardware parts and sensors to the Arduino and deliver the system connected correctly to the software side.

Ferhat Bal: Software quality assurance and testing the system at all.

3.0 Product Description

The MFR project will use two methods for user identification, and all of these methods will be used for identification, which means that identification and analysis depends on a combination of these methods to ensure that the system works properly, and each of them has some negative points so we will remove this negative point of a method by covering it from Positive points of another method.

1-) MATCHING APPROACH:

This method based on training the system in advance by flooding it with a set of samples and images without a user mask, and the system automatically extracts the characteristics and measurements of the face, nose, mouth and eye, the distance between the eyes, the distance between the mouth and the nose, the distance between the mouth and the first eye and the second eye, and the distance between the nose and the first eye second.

2-) RESTORATION APPROACH:

According to the gallery, the covered portions in the sample faces are restored here. The covered areas are detected by threshing the 3D image profound map values. The main component analysis is then carried out (PCA). Several techniques rely on the assessment of the covered areas. The iteration close point (ICP) technique was utilized. A curve is used to control the covered regions using a statistical estimate of the curve. Partly observed curves are completed using the PCA- technical curve model.

4.0 Major Deliverables

- **Masked Face Recognition**: The system will be able to recognize the masked user face, and the system will be able to work in scenarios like public control.

- **Quality**: we chose hardware parts that simulate a real scenario to be able to simulate a real scenario

- **Security**: The system will not work in any way with a wireless connection, the connection to the network will be done through ethernet port.

- **Decentralization**: The validation step for the faces will not work any way with centralize server, The validation step will be done through high TPS blockchain to make the system literally not crackable.

5.0 Delivery Scheduled

Task	Time (days)
Order the hardware parts from Turkey	7– 15
Hardware Connecting	5
RFID coding	1
Face recognition coding	3
Masked Face Recognition	4
Database creation	2
Testing the hardware & software	2
Testing the system in many scenarios	5
EVMC Smart Contract coding	3
EVMC Smart Contract Testing	2
Chainlink to Kadena bridge	2
Testing the smart contract on the mainnet	2
Total days	**39 - 46**

6.0 Cost Estimation

Hardware Part	Version	Piece	Price
Microcontroller	Arduino UNO R3 Kit	1	880 TL
Microchip ports Extenders	74HC595	2	5.25 TL
Ethernet Port	ENC25J60	1	107.5 TL
LCD Screen	1.8inch	1	219 TL
Power Cable	GePro UM-85	1	34.2 TL
Red Led	Red Led Package	1	3.5 TL
NFC Keychain	13.56 MHz	2	4.55 TL
RFID Card	125 kHz	2	4.55 TL
Breadboard	Normal	3	21 TL
Battery	9V	1	9.45 TL
Ticket NFC	13.56 MHz	5	4.2 TL
Jumper Cable Kit	M-M	2	19 TL
RFID Reader	RC522	1	31 TL
Green Led	Green Led Package	1	3.5 TL
Resistors	Resistors Kit	1	56.33 TL
Temperature Sensor	DH11	1	31.3 TL
Welding Gun	ZD 23 30W	1	103 TL
Gas Sensor	MQ-2	1	28.4 TL
Double Faced Pertinax	7*9 cm & 8*12 cm	1	33 TL
Camera	ESP32-CAM	1	157.5 TL
Soldering Tin	1.60 mm 100 g	1	75.7 TL
Multimeter	Marxlow DT-830D	1	51 TL

Total = 1885 TL

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