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Faculty of engineering

Department of Software Engineering

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Masked Face Recognition System (MFR)
Work breakdown structure dictionary

Project Supervisor

Assist. Prof. Dr. Parvaneh ESMAİLİ

Author

Ahmad Jawabreh & Zaid Mohtaseb

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WORK BREAKDOWN STRUCTURE DICTIONARY

1.0 Statement of Purpose

The purpose of this document is to provide a description of each of the tasks in the work breakdown structure (WBS) for **MFR project.** This document contains (a) the WBS item number, (b) the WBS item name, and (c) a description of the WBS item.

2.0 Work breakdown structure dictionary

WBS NO	WBS Item Name	WBS Item Description
1	Hardware connecting	Connect the all of the hardware parts that will be used for the system
1.1	RFID connecting	Connection of RFID parts to the Arduino which the alternative verification method
1.1.1	Connect RFID Reader	Connection of the RFID reader that will be used to detect the radio frequency
1.1.2	Connect the LED's	Connect the LED's to the Arduino that will be used as red led means close door and green led means opened door, blinking red led mean error and blinking green led means the door will be opened
1.1.3	Connect the alphanumeric LCD	Connect the alphanumeric LCD that will be used to show a message for the user (Hello message, Errors, etc.)
1.1.4	Connect the micro servo motor	Connect the micro servo motor that will be used to open and close the door (Moving the door lock in and out to open and close the door)
1.2	Masked face recognition connecting	Connecting the hardware parts that will be use in Masked face recognition process
1.2.1	Connect the camera	Connecting the camera to the Arduino which will be used to scan the user face

1.2.2	Connect wavesshare LCD screen	Connecting the lcd screen that will be used to show the user face to let the user know if the camera detect his face or not
1.3	Sensors connecting	Connecting all of the sensors that will be used in the system
1.3.1	Connect the distance sensors	Connecting the distance sensor to the Arduino that will be used to detect if there is a object around the system trying to use it, if there is no object the system will tun off otherwise the system will turn on this supposed to help in energy saving
1.3.2	Connect the gas sensor	Connecting the gas sensor to the Arduino that will be used alongside the flame sensor to detect the fire and cigarettes
1.3.3	Connect the flame sensor	Connecting the flame sensor to the Arduino that will be used alongside the gas sensor to detect the fire
1.3.4	Connect the speaker	Connecting the speakers that will be used to make noise if the system detect fire
1.4	Network connecting	Connecting the hardware parts that will be used for the network side of the project
1.4.1	Connect the ethernet port	Connecting the ethernet port to the Arduino that will be used to connect the system to the network
1.5	Power and electricity connecting	Connecting the power supply hardware parts to the system
1.5.1	Connect the 9V battery	Connecting the 9v battery to the system which will be used as alternative power supply If there is a power outage
1.5.2	Connect the power cable	Connecting the power cable adapter that will be used as the main power supply for the system
2	Coding	Coding the system

2.1	RFID Coding	Writing the code for the RFID system
2.2	Face recognition coding	Writing the code for the face recognition system that will help us to build the code of the masked face recognition on it
2.3	Masked face recognition	Writing the code for the masked face recognition
3	Database creation	Creating the database that will be used to test the project before finalizing the smart contract on Kadena blockchain
3.1	Database schema preparing	Preparing the database schema that will help us to understand the entity relationship and the architecture of the database at all
3.2	Database coding	Coding the database
3.3	Adding data to the database	Adding the a real test data to the database that will be used to test the system
3.4	Database connecting	Connection the database to the system which for both main and alternative verification methods (MFR and RFID)
4	Smart contract development	Development of the Kadena smart contract that will be used basically to put out system in the blockchain which will help the project to be littarly not hackable because of the PoW consensus protocol (Decentralization) of Kadena network
4.1	chainlink to Kadena blockchain bridge	Preparing the bridge between chainlink blockchain which is the provider of the data for the smart contract and bridge it with Kadena blockchain
4.2	Smart contract designing	Designing the working mechanism of the smart contract and how it will interact with its entities and designing the Algorithm for out smart contract

4.3	Smart contract coding	Starting to write the smart contract code with Pact programming language then convert it to Solidity smart contract to make the code EVMC
4.4	Smart contract testing	Testing the smart contract by focusing on the bugs and the security issues (Called audit step in blockchain community)
4.4.1	Testing the system with the smart contract on testnet	Testing our smart contract on the test net using Truffle and ganache environment
4.4.2	Testing the system with the smart contract on mainnet	Testing the smart contract in a real scenario by testing it on the mainnet
4.5	Deployment on mainnet	Deploy the smart contract after testing it, the deployment here will be directly on Kadena mainnet
5	Testing	Testing the System at all
5.1	Testing the connection of hardware parts	Testing the connection of the hardware parts if there is any type of wrong connection or missing to connect some parts and testing if all of the parts are working or not
5.2	Testing the system	Testing the hardware parts codes
5.2.1	RFID code testing	Testing the RFID code to make sure there is no faults in the RFID system
5.2.2	Face recognition code testing	Testing the face recognition code to make sure there is no faults in the face recognition system
5.2.3	Masked face recognition code testing	Testing the masked face recognition code to make sure there is no faults in the masked face recognition system
5.3	Testing the connection of the database	Testing the connection of the database to make sure there is no faults in the connection between the database and the system

5.4	Testing the system with the smart contract on the test net	Testing the system at all on the testnet to make sure there is no faults in the system at all with the smart contract
5.5	Testing the system with the smart contract on the mainnet	Testing the system at all on the mainnet to make sure the system behaves as it supposed to behave with the smart contract on the mainnet