Embedded Systems

Project Initial Design

Dr. Mohamed Abdelsalam

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Submitted by:

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System Description:

With the increased demand for security systems, people are looking for secure and easy ways to access their homes. Our goal is to develop an embedded system to lock and unlock doors based on voice biometrics by utilizing classical digital signal processing techniques. The system will unlock the door for a period of 10 seconds if the voice entered matches the saved one, otherwise, the door will remain locked, the speaker will buzz, and the homeowner will be notified. Our system will provide homeowners with a reliable and relatively inexpensive system that enables them to quickly and safely access their property.

Team Members:

- Abdelrahman Abouzeid
- Abdelrahman Elgammal
- Marawan Ibrahim

Hardware Requirements:

- STM32L432KC (MCU)
- Digilent Microphone (provided at AUC Workshop)
- Buzzer
- MCP3202 12-Bit Analog to Digital Converter
- Bluetooth Module / Wi-Fi Module
- Servo Motor (for locking mechanism)
- Android Mobile Phone

Software Requirements:

- STM32CubeMX

- Keil µVision

- Arduino Bluetooth Controller Application (on android device)

System Design:

Door Lock System using Voice Biometrics