Program: ESE 4009

INSTRUCTOR: Prof. Mike Aleshams

Group 8

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Project Proposal

Project Title:

Biometric Authenticator

Description of the latest similar system:

There are several software programs that encrypt the storage media by assigning a password, to protect files and information from unauthorized access. There are various techniques. Alternatives to secure devices already exist where there is no need to remember passwords. Biometric technology is one of the recent security advancements in which human impressions are required for further authentication. Fingerprinting system has been implemented in a product to lock hard drives and they are already available in the market. It has Fingerprint installed that take images, analyze and allow access to data.

Limitations of the latest similar system:

Limited to one device

- People have at least more than 1 storage device for different purposes.
- They have hard drives for large data storage, they have USB for temporary portable storage.
- To secure of all the devices we need to acquire each device that is compatible with a security system.

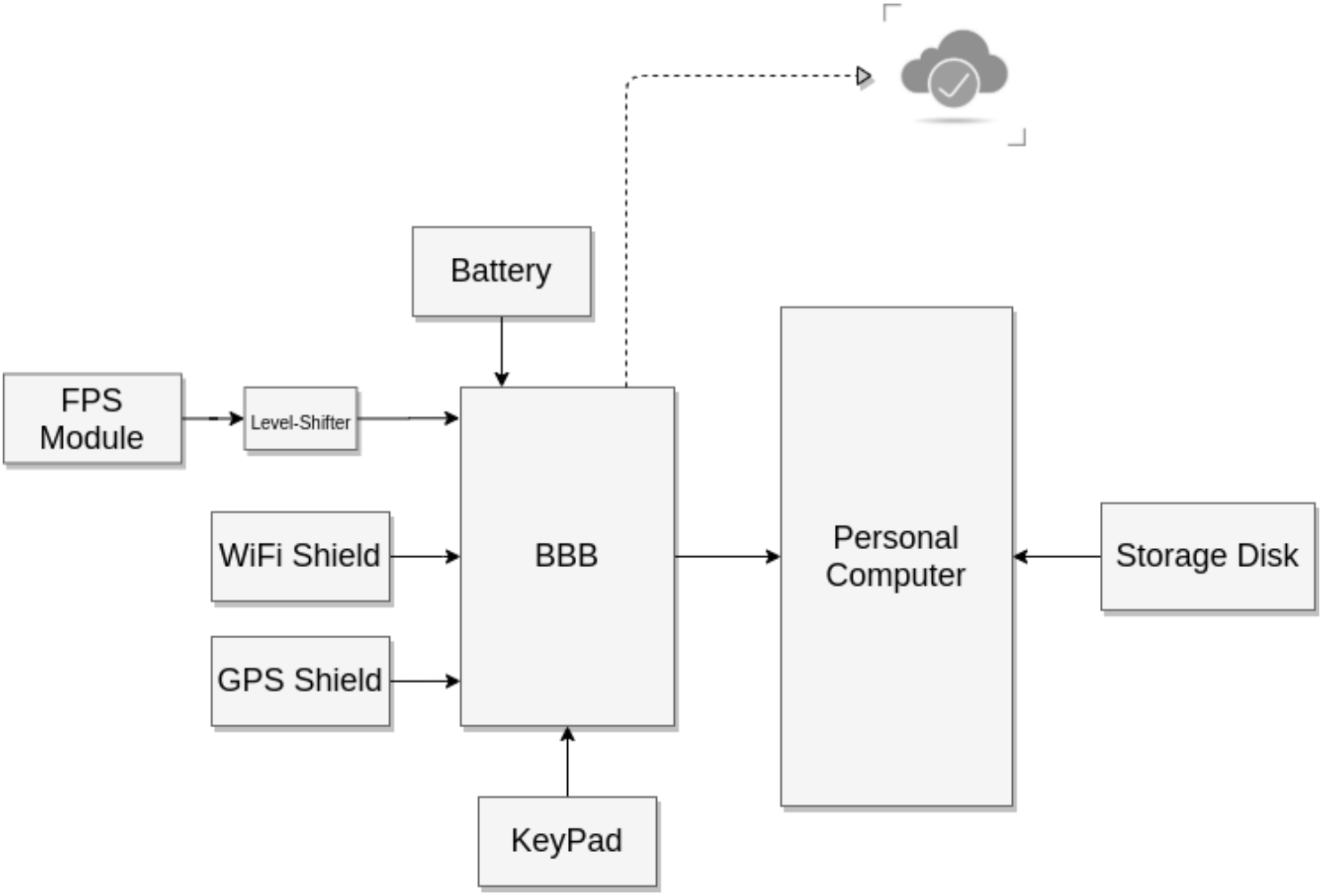
Expensive to buy

- Acquiring a biometric-capable device is costly.
- Investing biometrics in each device will eventually be expensive.

Unreliable

- All electronic devices are wearing out with constant use. Many storage devices have a problem with data corruption.
- In case of malfunction of the fingerprint system, it could lead to total loss of data on the device

Block Diagram



Features:

- **Use of various peripherals such as touch screens, cameras, microphones and speakers, GPIOs, timers, GPS modules, Bluetooth, WIFI, and ADC/DACs?**
    - Fingerprint Sensor is used for biometric authentication.
    - Wi-Fi Shield is used to connect the project to internet.
    - A keypad is used as an alternate authentication.
    - GPS Shield is used to acquire the authenticator's location.
    - A Level-Shifter compensates the voltage regulation between BBB and FPS
- **Use of I2C, SPI, RS232/RS-485, IrDA infrared, JTAG, USB, Bluetooth, IEEE 802.11 WIFI, IEEE 802.3 Ethernet, CAN and GPS protocols and systems**
    - UART communication protocol is used to connect the Fingerprint Sensor to the Beagle bone.
    - UART communication protocol is used to connect the GPS Module to the Beagle bone.
    - USB communication is used to connect the Beagle bone to the Internet using Wi-Fi module.
- **Use of preemptive versus cooperative scheduler operation; tick rate and time slicing; critical code; fixed, dynamic and hybrid task priority allocation; application-specific considerations; power management tactics; semaphores, mutexes and queues; debugging strategies; performance estimation?**
    - There are no priority tasks or mutex implementations in the project. All the peripherals in the project have fixed priorities and work according to the interrupt priorities given manually.

Hardware and Software

Hardware Requirements

- Fingerprint Sensor
- BeagleBoneBlack Board
- Level Shifter
- Cables
- Personal Computer
- Storage Media (No Discs)
- Wi-Fi Shield
- Keypad
- GPS Shield
- Li-ion batteries

Software Requirements

- Linux OS
- Eclipse IDE
- GCC compiler
- LUKS
- Dependencias.
- Internet
- AWS
- EasyEDA

Milestone (Achievements and Time Scheduling):

	Lovedeep Singh	Devang Gajjar	Srikanth Pendem	End Date
Task 1	**Hardware Requirements**	Install all the required software.	Hardware Component Testing	Jul-07
Task 2	Establishing Internet Connection to the project.	**Install all the required software.**	Hardware Component Testing	Jul-10
Task 3	Establishing Internet Connection to the project.	Draw schematics and connection prototyping	**Hardware Component Testing**	Jul-17
Task 4	**Connect WIFI to BBB/Establishing Internet Connection to the project.**	Draw schematics and connection prototyping	Interface GPS to the Beagle bone	Jul-17
Task 5	Setup the Cloud Server.	**Draw schematics and connection prototyping**	Interface GPS to the Beagle bone	Jul-24
Task 6	Setup the Cloud Server.	Interface Keypad to the Beagle bone.	**Interface GPS to the Beagle bone**	Jul-31
Task 7	**Setup the Cloud Server.**	Interface Keypad to the Beagle bone.	Interface FPS to the Beagle bone	Aug-07
Task 8	Setup the Cloud Server.	**Interface Keypad to the Beagle bone.**	Interface FPS to the Beagle bone	Aug-14
Task 9	Setup the Cloud Server.	Interface FPS to the Beagle bone	**Interface FPS to the Beagle bone**	Aug-21

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Instructor’s Remark