Galway - Mayo Institute of Technology

Final year project

Easysleep

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supervised by
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Declaration

This project is presented in partial fulfilment of the requirements for the Degree of Bachelor of Engineering (Hons.) in Software and Electronic Engineering at Galway-Mayo Institute of Technology. This project is my own work, except where otherwise accredited. Where the work of others has been used or incorporated during this project, this is acknowledged and referenced.

Acknowledgement

I would like to extend my thanks to my supervisor Paul Lennon who made sure I stay on track with my project as well as to Niall O'Keeffe for his support in embedded part of the project. I would also like to thank my wife Caroline for her ongoing support through my studies.

Table of Content

1 Project background and motivation

Aim of the project, Why?

The goal of this project is to create a device that would help resolve nocturnal enurism (bedwetting) so common in children above the age of 5.

During my research on the topic of bedwetting I have come to some interesting numbers. 15children above the age of 5 still wet the bed at night, while 5

2 Overview

What is Easysleep?, Research, Architecture diagram

The project consists of two devices that are able to communicate via Bluetooth and a mobile phone application. The idea behindthe project is a master device capable of detecting moisture and recording the time and the data of this event. The master device can then notify the secondary one (bracelet) responsible for waking up the sleeping person on the following night prior to the event-time and also receive acknowledgement status. The master device can also communicate with a mobile phone application. The user can silence an ongoing alarm, request current date and time of the system or change it and also request data of last ten events that would then be saved into an SQLite database on the phone for anytime access or for statistics/progress.

3 Hardware

Hardware used, Connections, Specifications

3.1 FRDM-K64F

FRDM-K64F
placeholder

FRDM-K64F is a very capable development board manufactured by NXP Semiconductors with a headquarters in Eindhoven, Netherlands and Austin, Texas. I have chosen this board because of my familiarity with it and of its abilities. This board and its cousin KL25Z were used throughout the course as part of the embedded systems modules.

Board specifications:

- 120MHz ARM Cortex-M4 microcontroller

- 1MB Flash memory

- 256kB RAM

- Ethernet

- SDHC

- low-power

- FXOS8700CQ accelerometer and magnetometer

- Add-on Bluetooth module: JY-MCU BT board V1.05

- RGB LED

- 2x user push buttons

- form-factor compatible with Arduino Uno Rev.3 pin layout

3.2 Parallax 28821 Vibration motor

Vibration motor specifications and connection diagram l;kjsd sl;kdj sasfdl;kjsad sl;akkfjj sdflkjsadf s;lafj lkjkjsd ;lsajjf sad;lfkj ;jas ;slkfjlskdk sakfjjsa f;lkksjff ;sakfsd f;lkksjafkjsdl;kjsdflkkjsdlksjdflksjfl lsjflk-skjfjls lkksjflksjflsdfj lsdjflsjflsjflsfjslkkfjslkkfjslfj lsdjflsjf;laj;alkjd a;kljdf ;alkskdfjj slkfjsf slfkjsf slkfdkjls-dkfjslfkjj kajsd aj ;lajd lsj fljslfdj sfojoiruwoeiuw slfd-kjsf ouw roiwuwe lsjkfs dofiuwrp lkjs foiuwer ljsfoiuwr oiuwr pwurqpuwqpourwkj sfoiuwe foiuwe wjfpquopiwuer piqur w woroiw roi-wiurowuowuowu woiuwoeiuweor qpiwr ouqpriwqorwor poqproiuwu ro
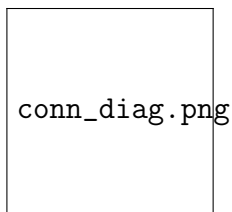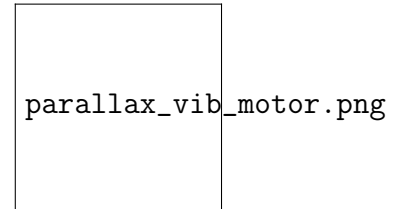
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3.3 Buzzer

Buzzer specifications and connections

3.4 HC-05 Bluetooth module

HC-05 specifications and connections

4 Software

Software used, Programming languages, IDEs, Software tools

4.1 MCUXpresso

development of code for K64Fs

4.2 Android Studio

mobile application development

4.3 Other

SystemView, FreeRTOS, Pulseview, Git/Github, project management software, BT configuration

5 Conclusion

what was the development of the project like

6   References

7 Bibliography