Motivation

- Technically challenging and fun
- Good way to create backup notes
- Share written notes with classmates
- Could be utilized by groups such as SSDS (Specialized Support and Disability Services)
- Lots of room to expand or narrow scope

Functionality

- Wireless communication of written characters from pen to board
- Attached pen cartridge for visibility of written work
- Measures the acceleration pattern of the pen
- Recognition of written characters by comparing the pattern to calibrated templates
- Recall character templates from memory
- Displays best match character

Components

Implementation on BE2 Board:
- XBee S1 transceiver module
- SD Card Memory

Implementation on Pen Unit:
- XBee S1 transceiver module
- PIC16F873A Microcontroller
- Power Source
- Switches (Trigger, Power)
- ADXL362 Tri-Axis Accelerometer

Future Work

- Smartphone integration with Bluetooth
- Math Functionality
- Pressure, proximity, or voice sensor for activating recognition
- Accuracy refinement
- Multiple user interaction

Design: Hardware

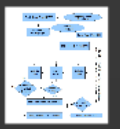
Challenges

- Matching communication rates across components
- Finding components which all fall within voltage and current range
- Size constraints
- Managing data types
- Balancing memory and processing speed

Design: Software

Mode Selection
- Calibration
- Character recognition

Pattern Matching Algorithm
- Dynamic Time Warping
- Template grouping



Accelerometer-Based Character Recognition Pen

James Chang Kyle Buchanan Theodore Pham

DEMO

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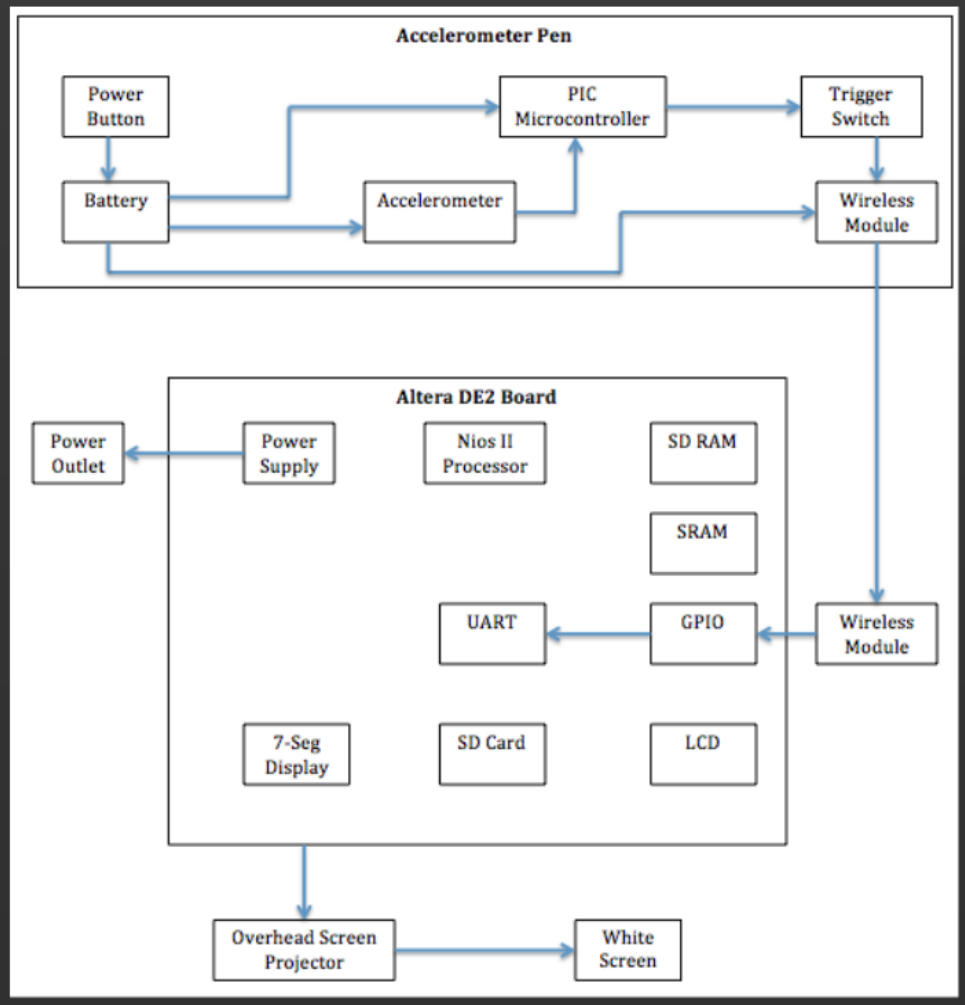

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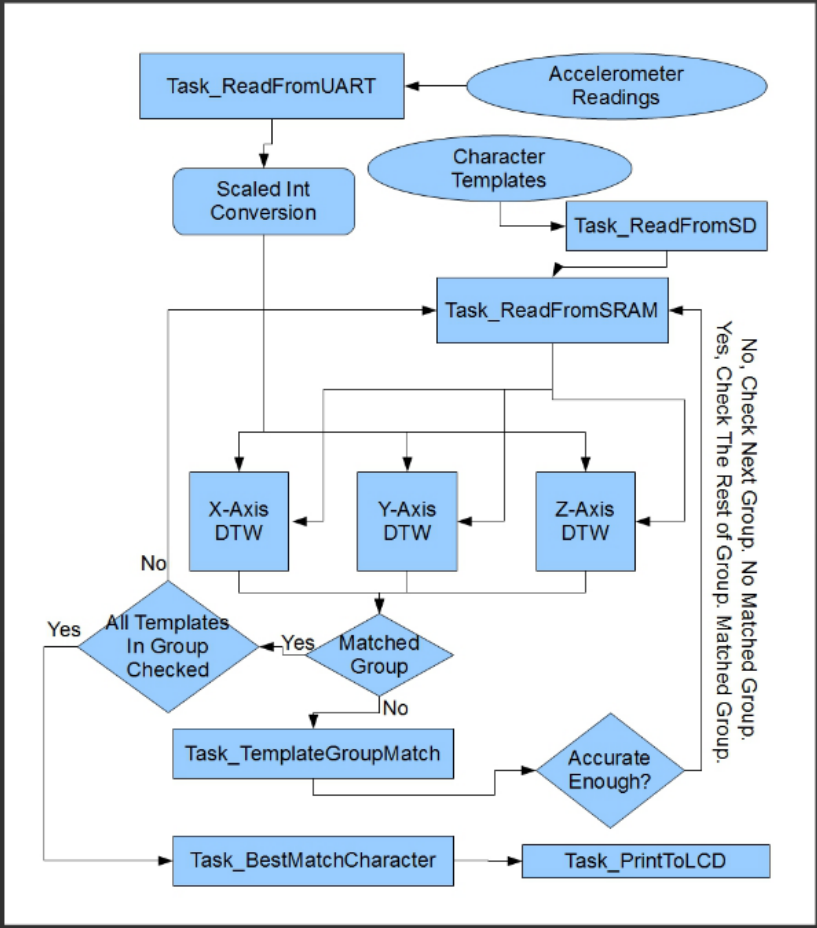

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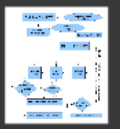

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