

MICROPROCESSORS

PROJECT

Progress Report 2

TOUCH TO SING

Carried out by

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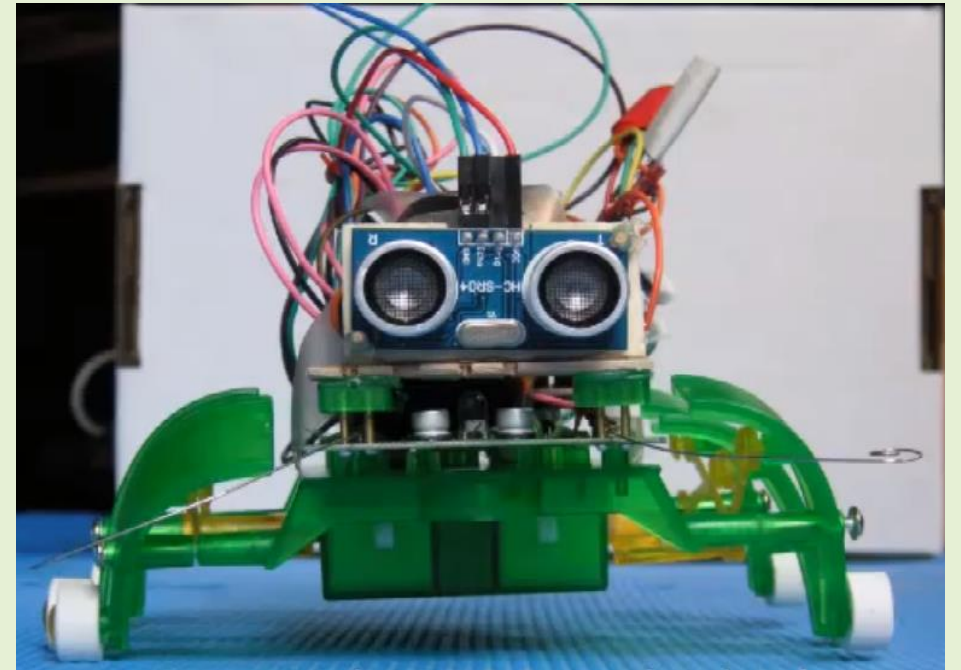
Overall status

Hardware

- Individual components are tested
- Integration to be done

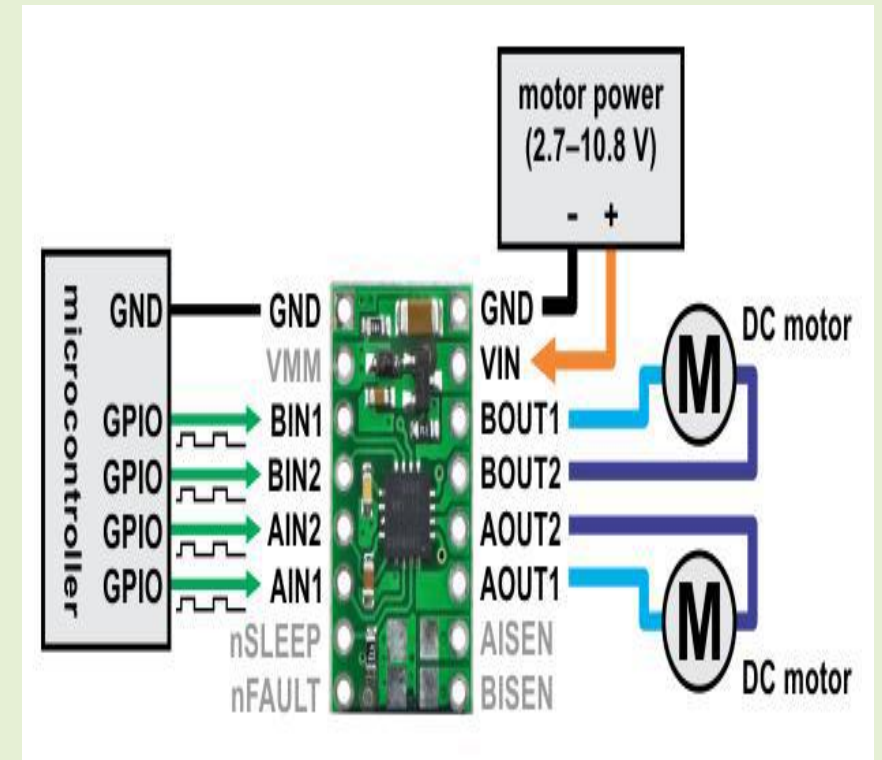
Software

- Coding done for sensor and for other components is under progress
- Code generated and executed using CCStudio



Control of DC Motor

- Timer-A
- Testing with various parameters.
- Counting up to value stored in CRR0 register.
- Configure TACTL- Timer Control Register.
- Yet to Integrate with the other components.
- Challenge– to run the motor according to sensor response.



MSP 430 CAPACITIVE TOUCH BOOSTER PACK (430BOOST-SENSE1)

BOOSTERPACK INTERFACE:

P1.0- Centre LED i.e LED 9

P2.0- Proximity Sensor

P2.1- Wheel Sensor Left

P2.2- Wheel Sensor Down

P2.3- Wheel Sensor Right

P2.4- Wheel Sensor Up

P2.5- Centre Button Sensor

➤ Capacitive Touch User Experience

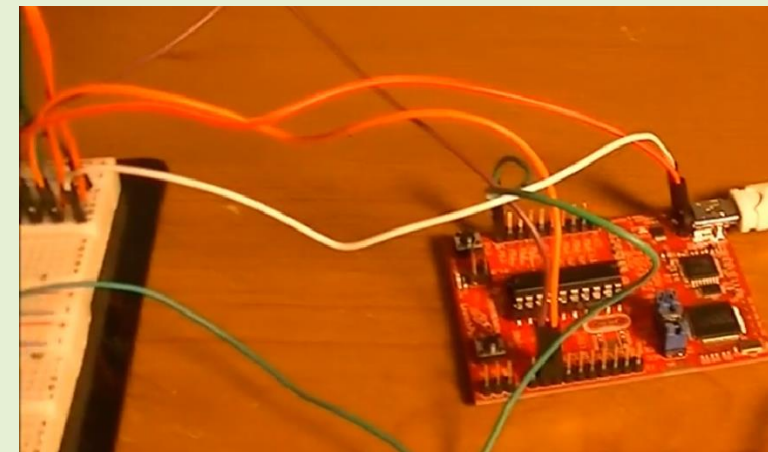
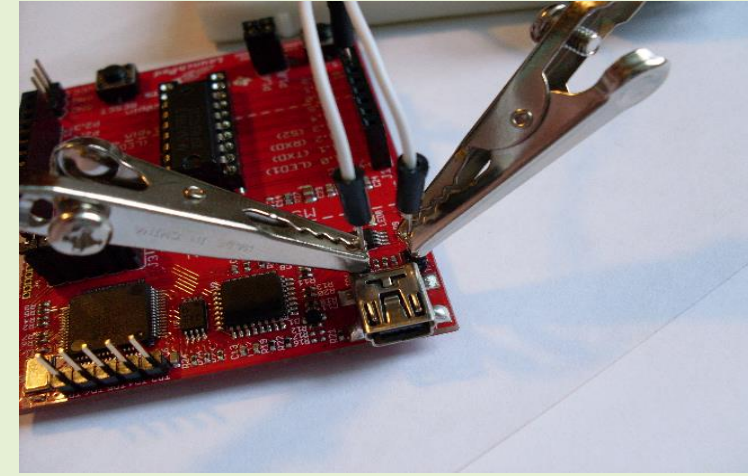
- LaunchPad Capacitive Touch BoosterPack Firmware Demo
- LaunchPad Capacitive Touch BoosterPack GUI Demo
- Mediapad



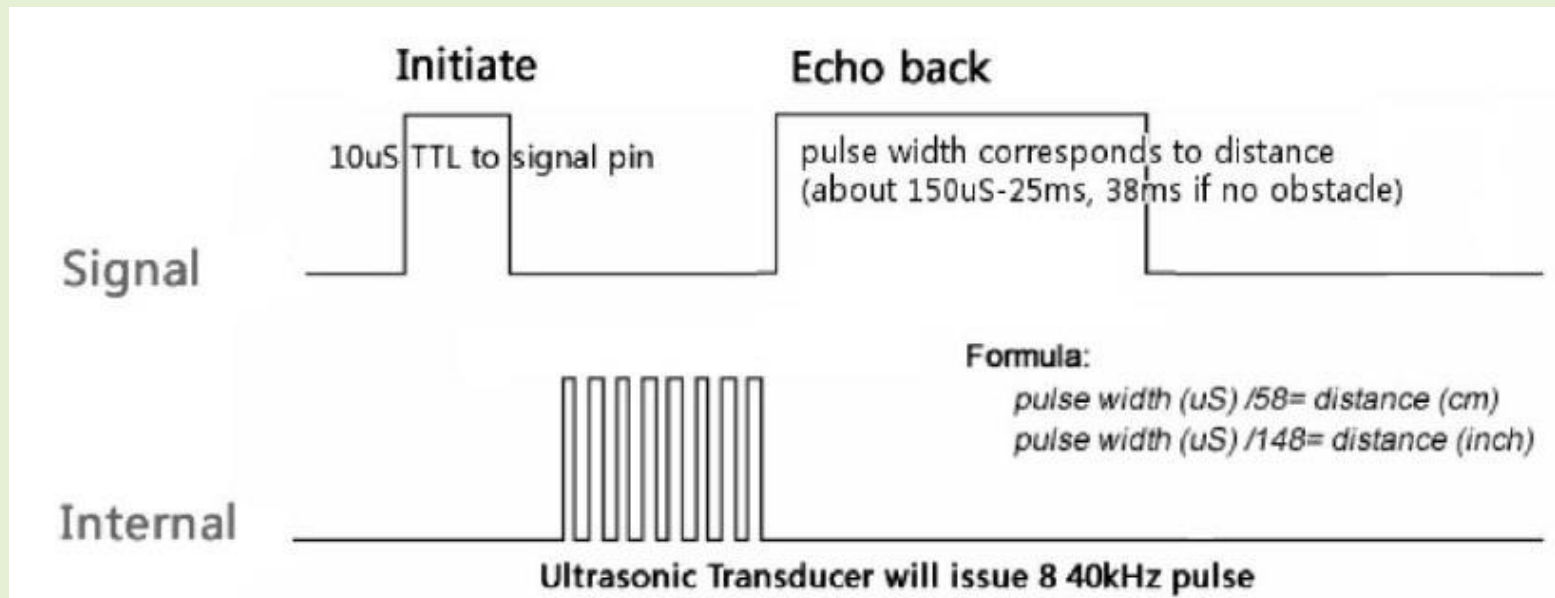
HC-SR04 ULTRASONIC DISTANCE SENSOR ON TI MSP430

- Taped in the tie points on the Launchpad, labeled TP1 and TP3.
Input is taken from TP1 and TP3

- Pins 12 and 13 of the Launchpad are hooked up to Trig and Echo on the HC-SR04. VCC and GND on the HC-SR04 are connected to the hacked test points (TP1 and TP3) on the Launchpad



- Trig of SR04 receives a pulse of high (5V) for at least 10us, this will initiate the sensor to transmit out 8 cycle of ultrasonic burst at 40kHz and wait for the reflected ultrasonic burst
- When sensor receives reflected wave Echo pin is set to high (5V) and delay for a period (width) which is proportion to distance
- Width (Tone) of Echo pin is measured for distance calculation.



SD Card

- SPI – Full Duplex Mode
- Shift Register Configuration(Serial - First In First Out)
- Master Clock (only Master has clock)
- Clock Polarity and Clock Phase(CPOL & CPHA)
- FAT to access SD card.

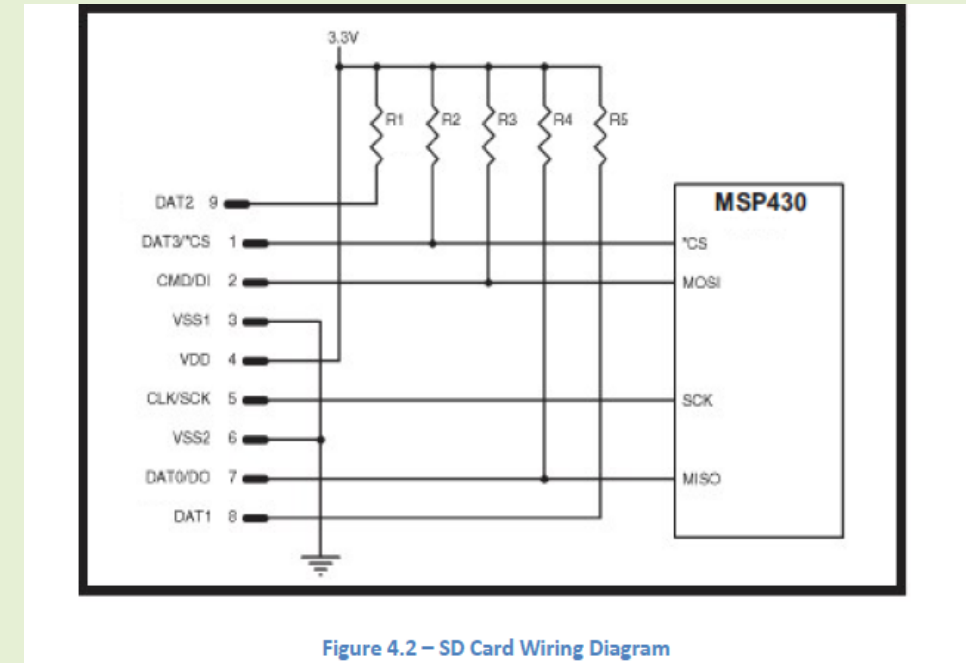
which FAT system? – Petite File System for tiny microcontrollers.

- USCI Interrupt – USCI-Ax (lone Interrupt) to enable SPI master Clock.

Table 59. CPOL and CPHA Functionality

	Leading Edge	Trailing Edge	SPI Mode
CPOL = 0, CPHA = 0	Sample (Rising)	Setup (Falling)	0
CPOL = 0, CPHA = 1	Setup (Rising)	Sample (Falling)	1
CPOL = 1, CPHA = 0	Sample (Falling)	Setup (Rising)	2
CPOL = 1, CPHA = 1	Setup (Falling)	Sample (Rising)	3

- SPI Transmit Interrupt Operation – UCTXIFG is set to indicate UCxTFBUF is ready.
- SPI Receive Interrupt not used.
- Some necessary Header files while using the FAT System-
diskio.h,integer.h,mmc.h
- Operating frequency between 100 – 400khz to support all card types and Baud rate must be set accordingly.(considering max frequency of 25Mhz).
- Speaker not yet tested.



THANK YOU