

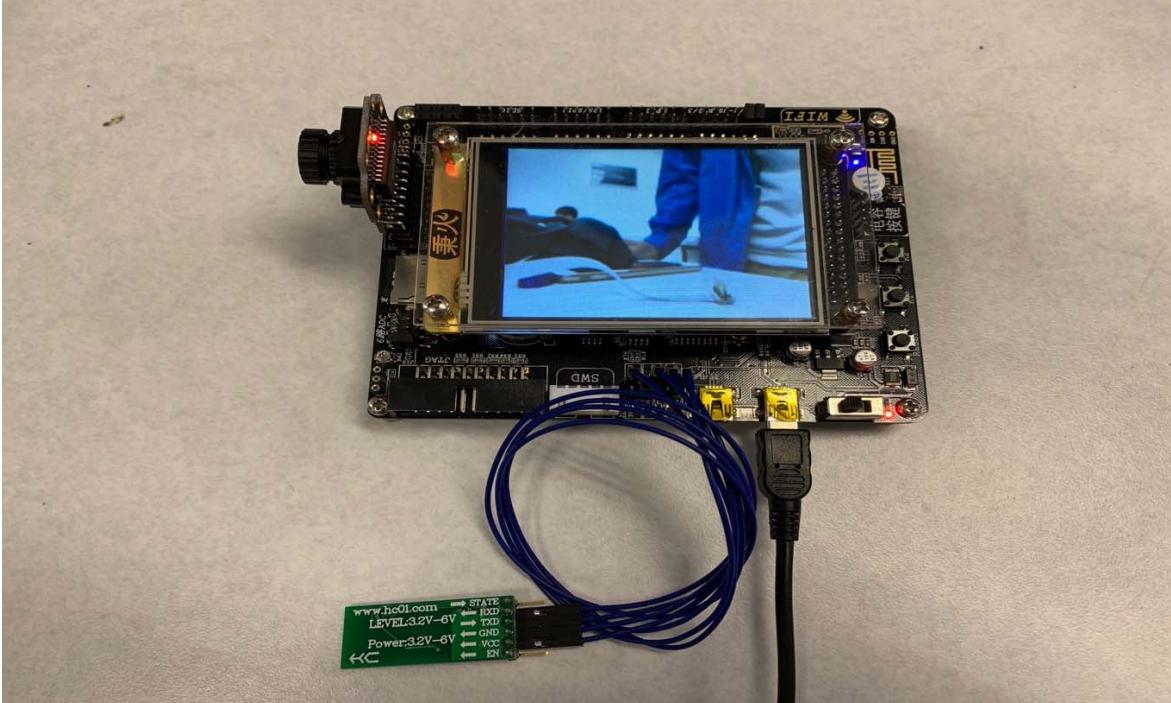
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	1
Project Title	Smart Camera
Name of Student 1	Ma Ching Man
Name of Student 2	Hung Yat Long

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Display real time image
 - the camera module directly transfer image into stm32
 - display on LCD screen real time
- Take photos
 - press the specific button(K1)
 - LED turn to red color
 - camera module captures the image data and process by stm32
 - then save into SD card in BMP 240x320 format
- Display photos
 - press the specific button(K2) and go in gallery mode
 - LED turn to blue color
 - display first photo on LCD screen from SD card
 - press (K2) to next photo, press (K1) back to camera mode
- Remote Control
 - using phone app connect stm32 by Bluetooth
 - function 1: remote take photo
 - function 2: show the number of photo saving in SD card
 - function 3: remote continuous photo taking
 - function 4: remote delay photo shooting
 - function 5: display the exact photo on LCD

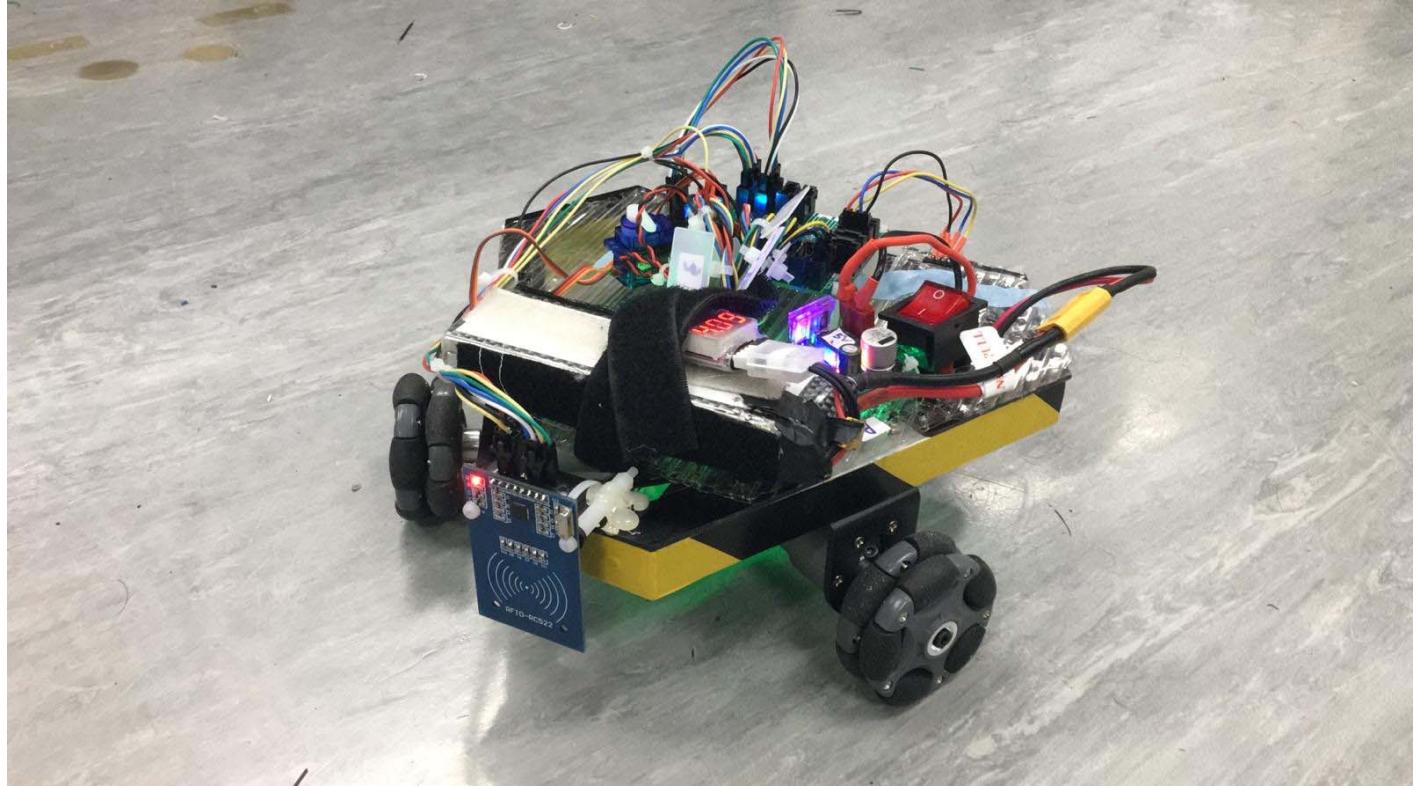
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Group Number	2 (Use other MCU)
Project Title	Medical Delivery Robot
Name of Student 1	LIN, Yuanqiao
Name of Student 2	Chan Chak Lam Jonathan

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Three-wheeled omni-directional robot
- Accurate Task schedule (Timer interrupt and system tick counter)
- PID controller for wheel motors (Timer – PWM, Timer – Encoder (Hall effect sensor))
- Data Logging and get command via Bluetooth module (UART, DMA Tx, interrupt Rx)
 - Data recorded and plotted by MATLAB to debugger (eg. PID tuner, IMU calibration)
- RFID tags/cards reading (SPI)
- Position sensing, IMU – Accelerometer, Gyroscope, Thermometer (SPI)
- Image sensor (Camera) - Color filter, Edge/line detection (SCCB(I2C) & FIFO(DCMI))
- TFT display - Realtime image and information display (4 signal wires - SPI)
- SD card – data read and write with FATFS (SDIO)
- Audio indicator output (DAC)
- CANBUS Communication between MCUs (CAN)
- Watchdog Timer to reset MCUs if fault is happened

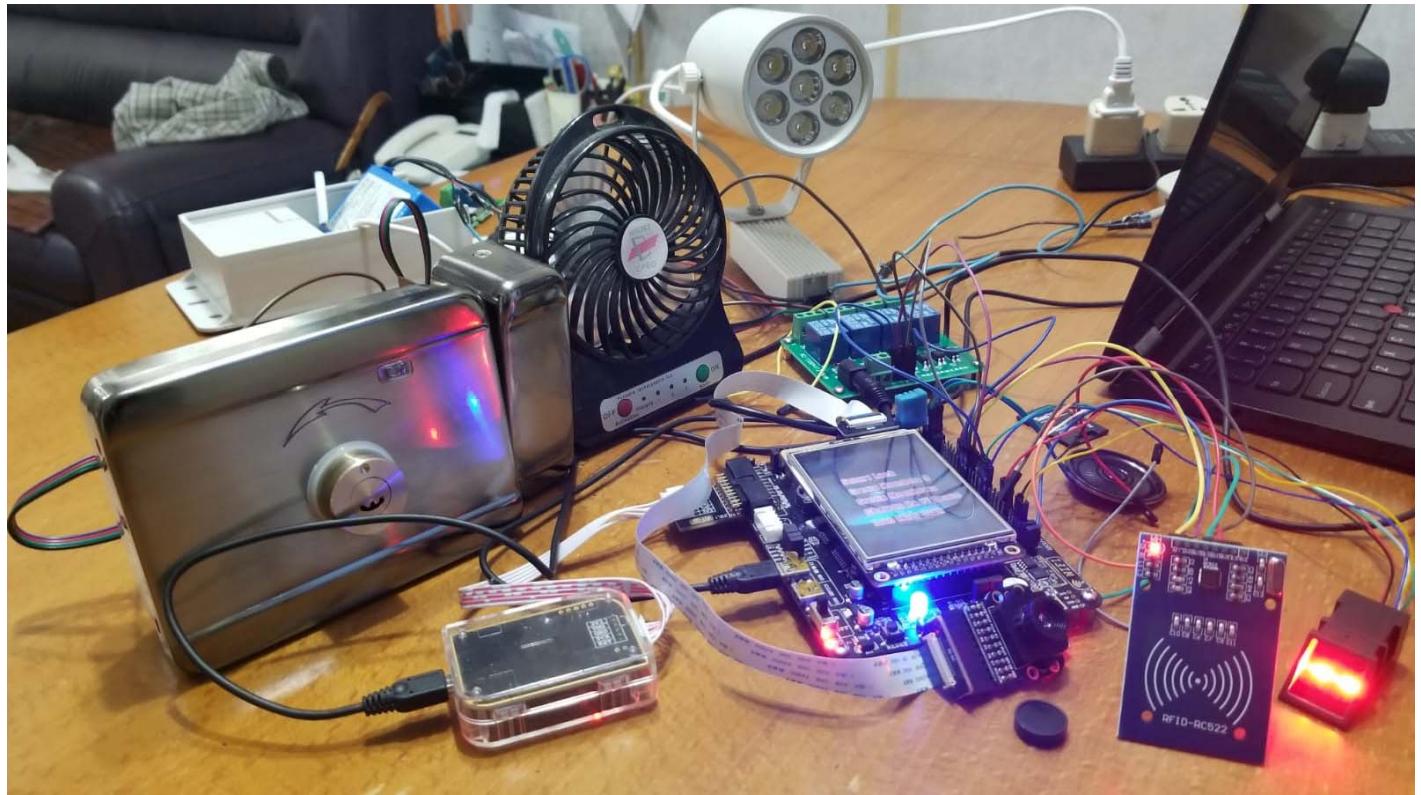
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Group Number	3
Project Title	Smart lock
Name of Student 1	Lam King Sum
Name of Student 2	Cheung Ka Yi Grace

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Fingerprint unlock
- Unlock, lighting and fan control through Wi-Fi signal in an app (ESP8266)
- Unlock method: pin password with LCD Touch screen
- Real Time display of incomer's picture (OV7725 camera)
- Incomers' photo captured to SD card
- Temperature and Humidity detect with smart home functions (turning on fan and humidifier when temperature or humidity are above certain degree) (Using DHT11)

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Group Number	4 (Use other MCU)
Project Title	SuperDrone
Name of Student 1	Luk Yan Yi
Name of Student 2	Hui Kwan Nok Chris

Please attach ONE photo of your project here



Please list the functions of your project in point form

What can we do?

- Able to control the drone with mobile application by sending and receiving data through WIFI module
- Get the drone case by 3D printing
- Get components in any size and design the drone in any way we want
- Make it into a DIY kit in educational use

What can the drone do?

- Control the output by using PID system
- Determine the posture of the drone by using compass
- Power detection
- Electronic switch
- Collide prevention
- Height detection
- Temperature detection

ELEC 3300 Project Summary Sheet

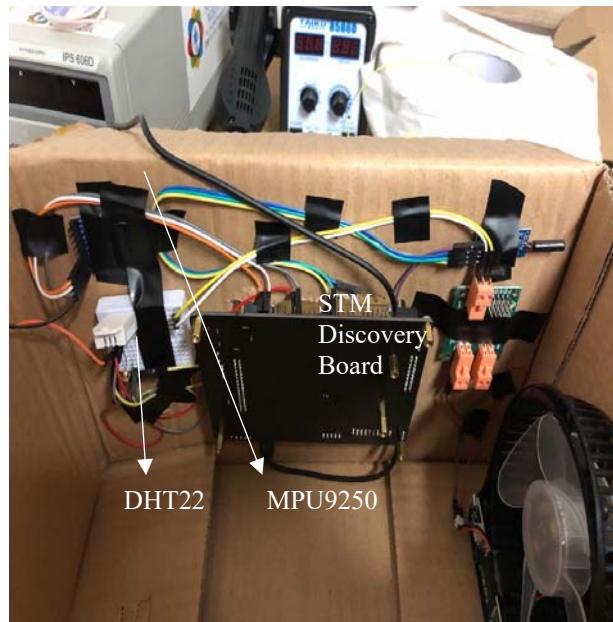
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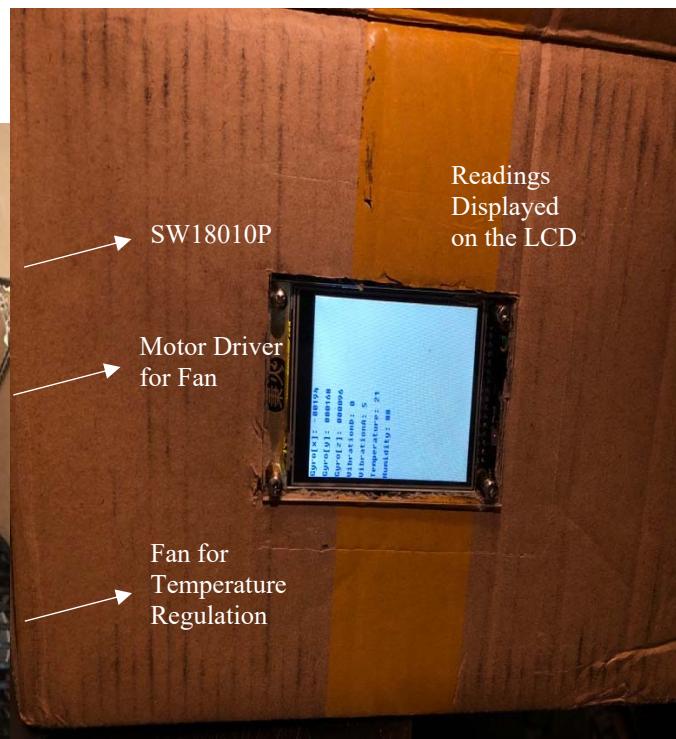
Group Number	5
Project Title	Logistic Environmental Monitoring and Regulation System
Name of Student 1	Mohammad Hanif Dean NADHIF
Name of Student 2	Adrian Prawira SUSANTO

Please attach ONE photo of your project here

Inside of the box view:



Outside of the box view:



Please list the functions of your project in point form

- Detect unwanted vibrations and sudden shocks to the box using the SW18010P vibration sensor and alert the user when these shocks occur by ringing the buzzer. Connected through ADC.
- MPU9250 gyroscope and accelerometer to gain the correct orientation the box is in and sudden acceleration to the box. Connected through I²C.
- DHT22 temperature & humidity sensor is used to collect the surrounding temperature and humidity of the environment inside the box. Communicated through its own protocol.
- Regulate the surrounding temperature using a PWM-controlled fan if the detected temperature from the DHT22 falls below a certain threshold.
- Display these vital information (temperature, humidity, orientation) on the LCD
- Buzzer when non-ideal condition is met

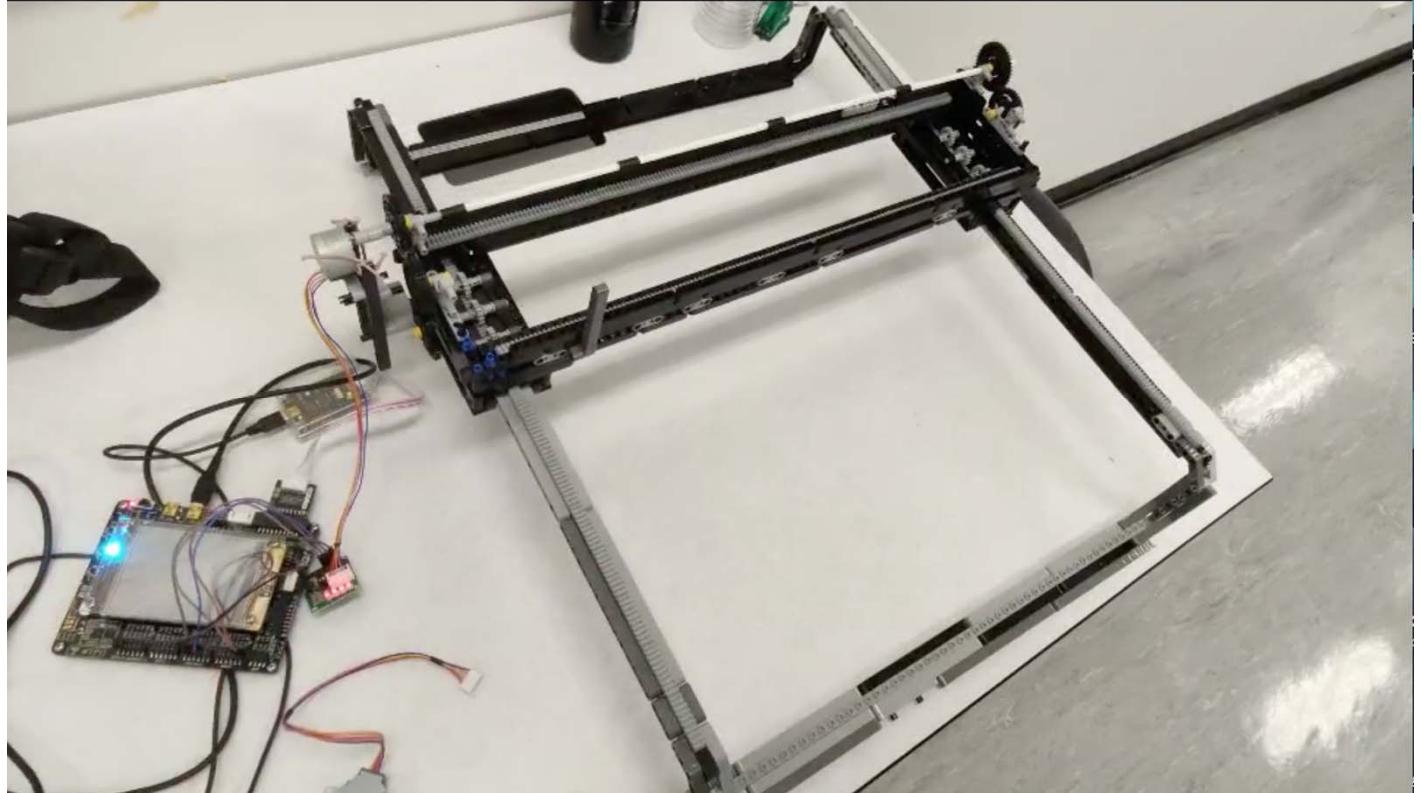
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Group Number	6
Project Title	Gomoku Chess Robot
Name of Student 1	Gengmo QI
Name of Student 2	Shiyi QIAN

Please attach ONE photo of your project here



(Photo is the incomplete view)

Please list the functions of your project in point form

- Motor A controls the first part to move along the X axis of the board
- Motor B controls the second part, which sit on top of the first part to move along the Y axis of the board
- Motor C controls the robotic arm to move along the Z axis to move up and down
- The robotic arm can pick up and drop off items(chess)
- The robot can detect player's chess on the chess board
- The robot can make a decision to play the next move

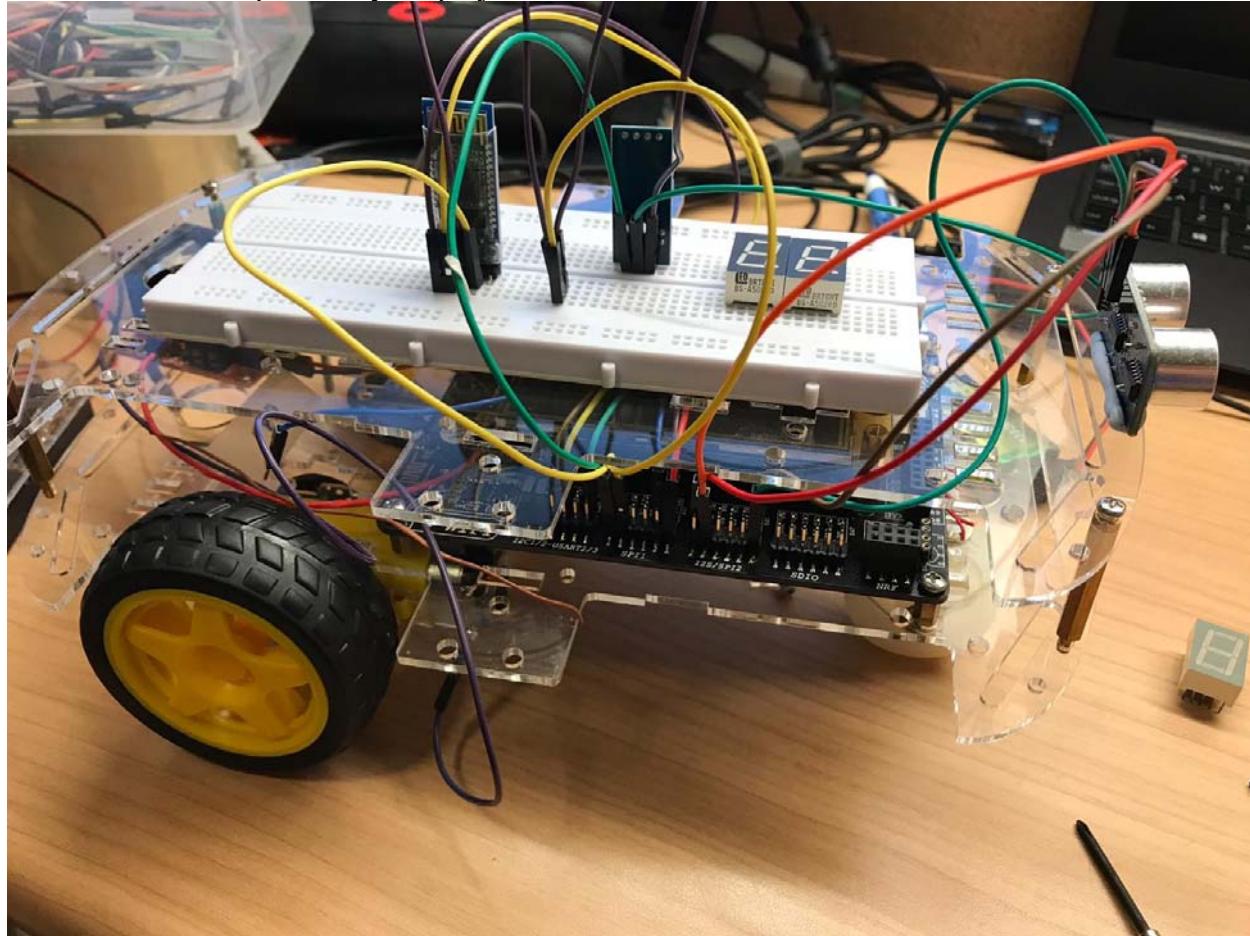
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Group Number	7
Project Title	Bluetooth Supermarket Shopping Cart
Name of Student 1	To Yik Long
Name of Student 2	Yeung Yiu Fai

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Use Bluetooth module HC-05 to control the car on android smartphone app with virtual buttons or phone's accelerometer
- Two rear wheels are controlled by PWM signal generated by the STM32
- Ultrasonic sensor HC-SR04 is used to detect frontside obstacles. If obstacles are detected within 1m, the buzzer will turn on to notify the user and the car will stop gradually.
- Temperature sensor DHT-11 is used to collect environmental data. The detected temperature will be displayed through seven segment LEDs to notify the user to be aware of the spoilage of food.

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Group Number	Group 8
Project Title	HK coins sorting machine
Name of Student 1	Lau Ho Nam
Name of Student 2	Lee Man View Raymond

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Auto detection of coins insertion
- Identify and sort HK coins
- Identify Inappropriate coins

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Group Number	Group No.9
Project Title	Coin Arcade Game - Pierrot
Name of Student 1	Cho Chak Bong
Name of Student 2	Lee Tsun Yin Alex

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Detect suitable coin to pass through coin acceptor module
- Control upper machine arm to guide the coin to target path
- Control addition assistance arm
- Count player's score
- Quit all the coin when two coins at the same column

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Group Number	10
Project Title	Air drone
Name of Student 1	LEUNG Chun Ho
Name of Student 2	PAK Ho Tin

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Fly in 6 directions as upward, downward, forward, backward, leftward and rightward.
- Self-stabilization in air by adjusting the speeds of motors by STM32 after reading data from gyroscope and accelerometer sensor
- Receive wireless modulus

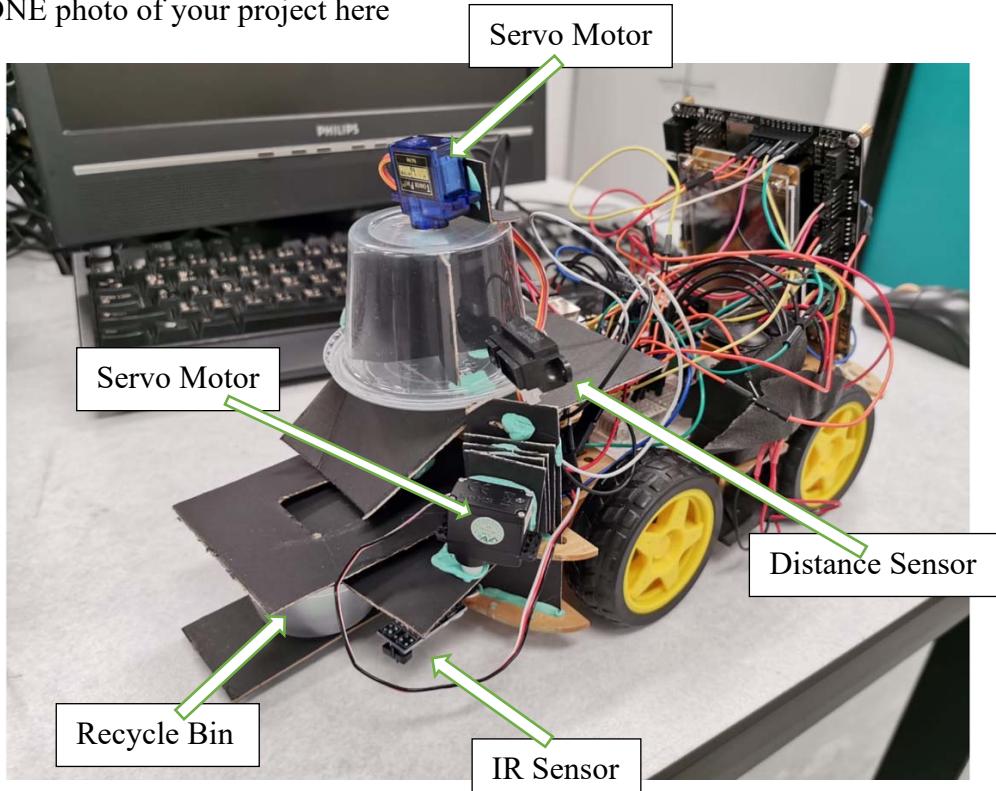
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Group Number	11
Project Title	O-PPA Auto-Prescription Personal Assistant
Name of Student 1	TAN, Tun Jian
Name of Student 2	LAM Cheuk Nam

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Obstacle Detection - Detect Obstacles with IR sensors in Automatic Moving Mode
- Hand Detection – Detect whether patients have taken the medicine or not with IR sensors in Medical Dispense Mode.
- Display Time Function – Display real time on the LCD screen
- Drive Function - Motors drives the robot car with L298N
- Automatic Moving Function – Move to the Destination and back to the starting point automatically
- Dispense Medicine Function – Dispense pills by rotating servo motor
- Alarm Function – Alarm goes off with buzzer
- Recycle Medicine Function – Recycle the untaken pills

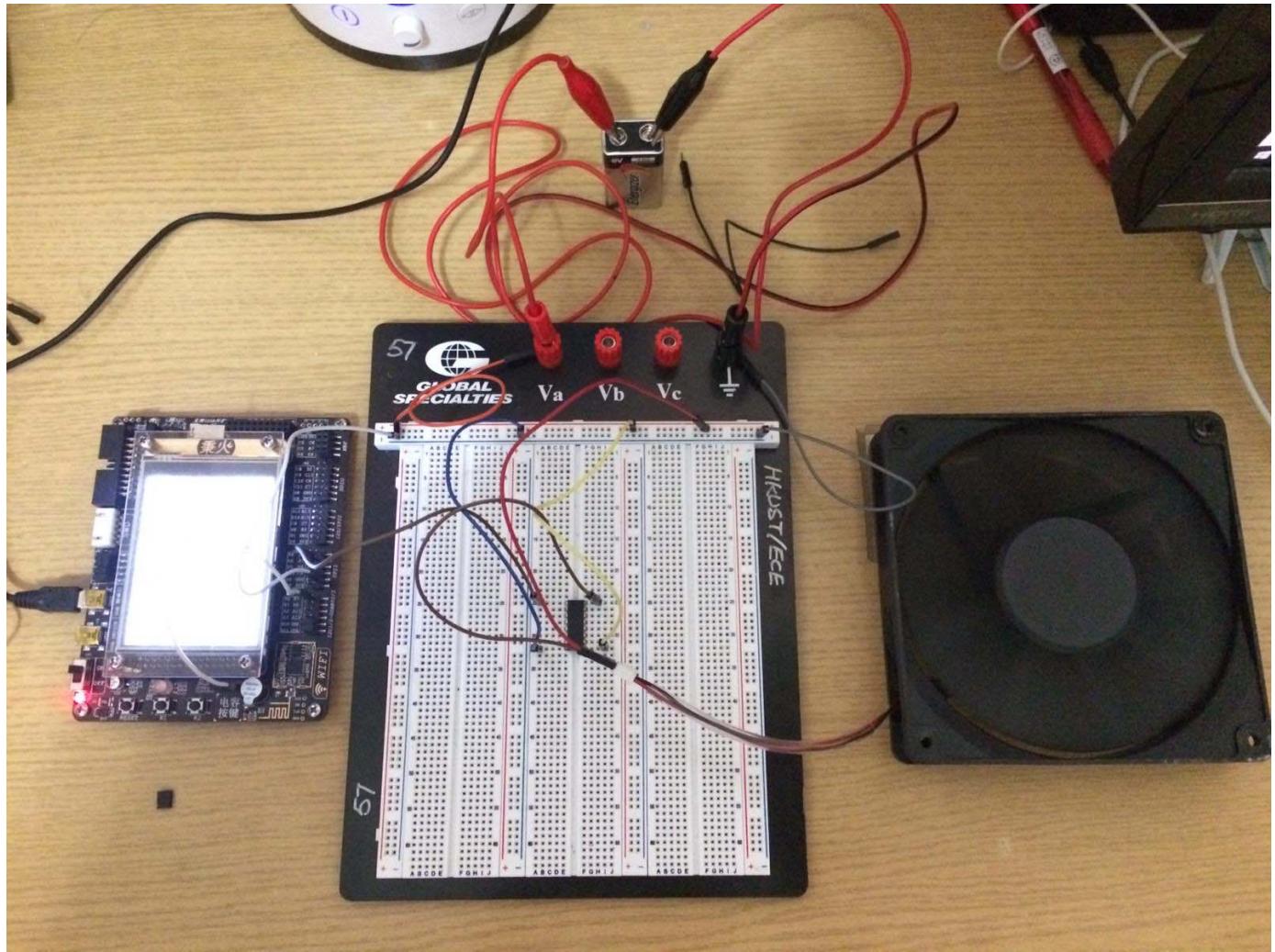
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Group Number	12
Project Title	PC Hardware Usage Monitor with Fan Control
Name of Student 1	Chan Chun Lam
Name of Student 2	Shih Ho Yin

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Communication between PC and STM32
- Button input used to change the mode of display and data to be received in the transmission
- Display PC hardware usage on STM32 LCD
- Indicate the mode of display by STM32 LED Color; three mode, 1st: Show CPU Usage; 2nd: Show GPU Usage; 3rd: Show RAM Usage
- Indicate the process of data transmission by blinking of STM32 LED
- Control the speed of an extra fan used as cooling by 2 main process units' usage (CPU & GPU)
- Sound the buzzer to notify the user when the process units' usage are too high (>80% on average)

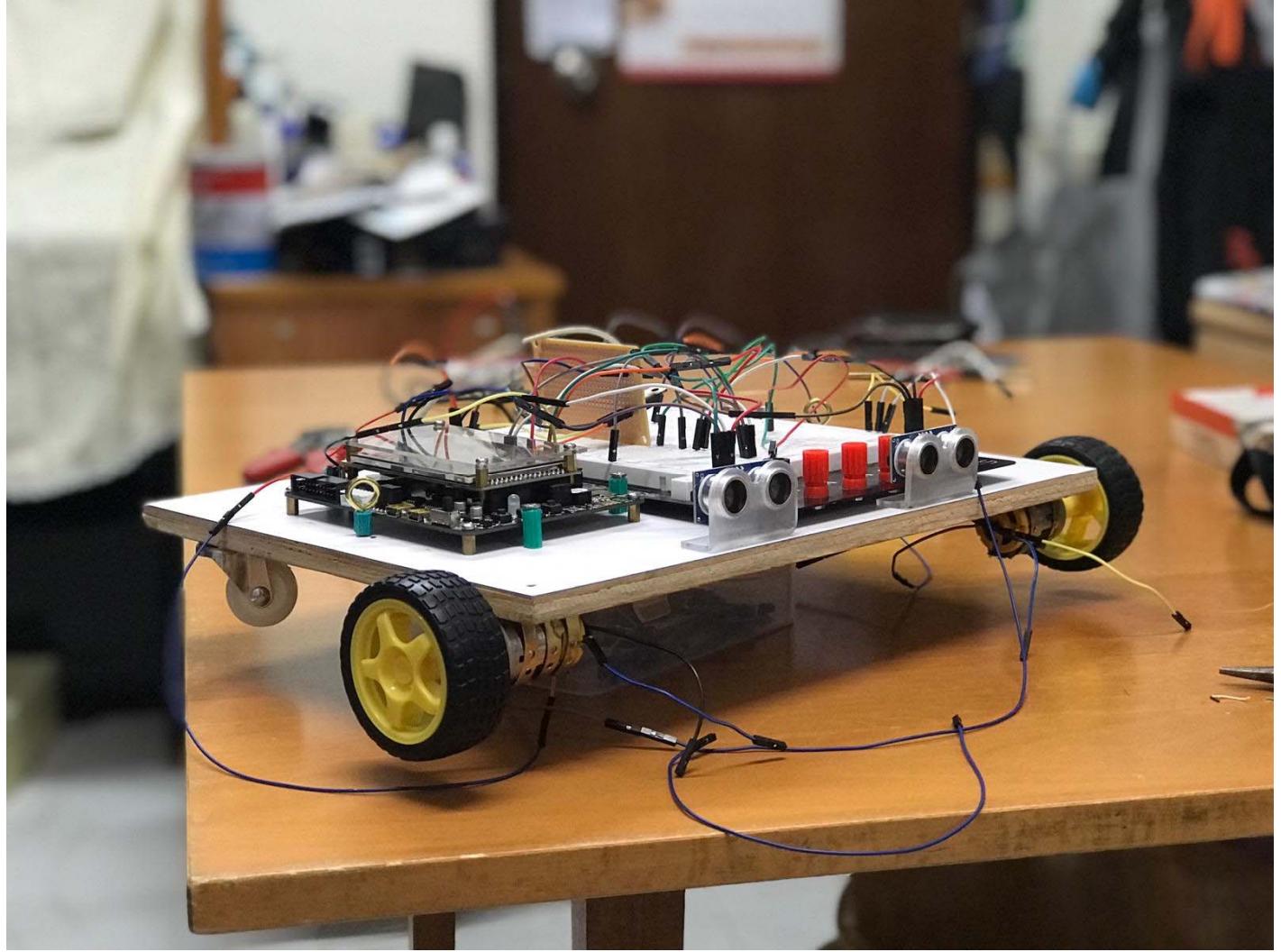
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Group Number	13
Project Title	Smart Container Car
Name of Student 1	TING Tsz Hin
Name of Student 2	CHONG Kin Ye

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Auto-car which follows the user
- Obstacles avoiding
- User faint detection

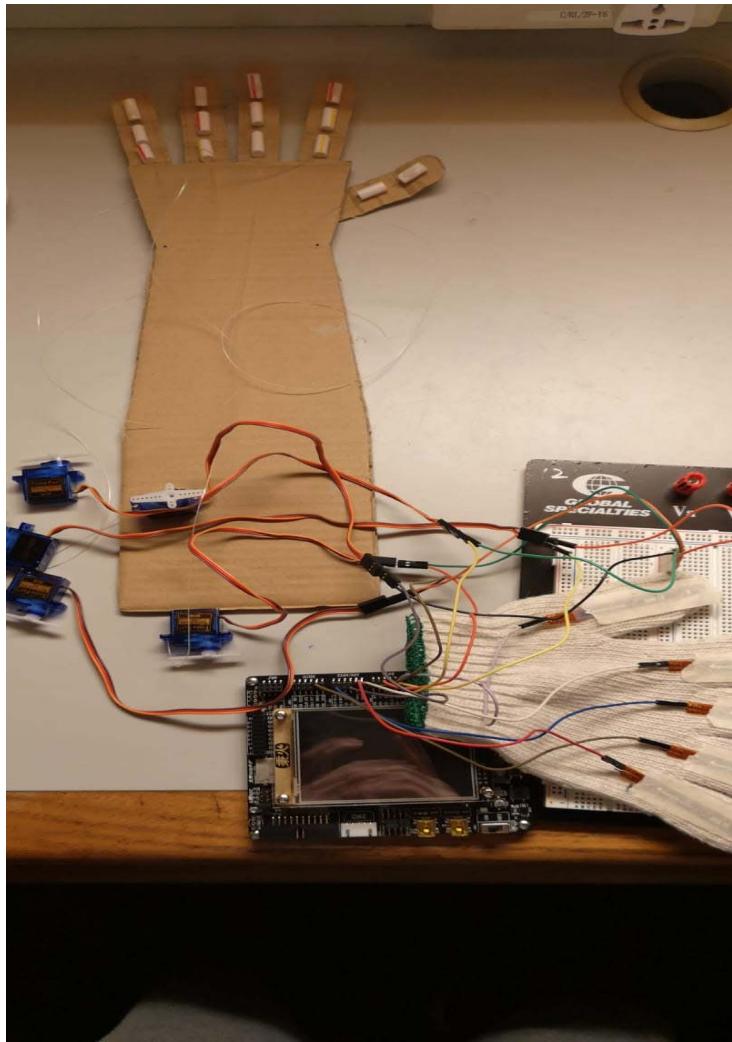
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Group Number	14
Project Title	Mechanical hand
Name of Student 1	Sze Pui Hong
Name of Student 2	Hau Kai Hong

Please attach ONE photo of your project here



Please list the functions of your project in point form

- To receive analog signal from sensors
- To convert analog signal to digital signal
- To transmit the digital signal to motors through stm 32
- Motors will pull the fingers on the fake arm
- This project acts like a prothesis of hand
- Can be used to grabs things in light weight

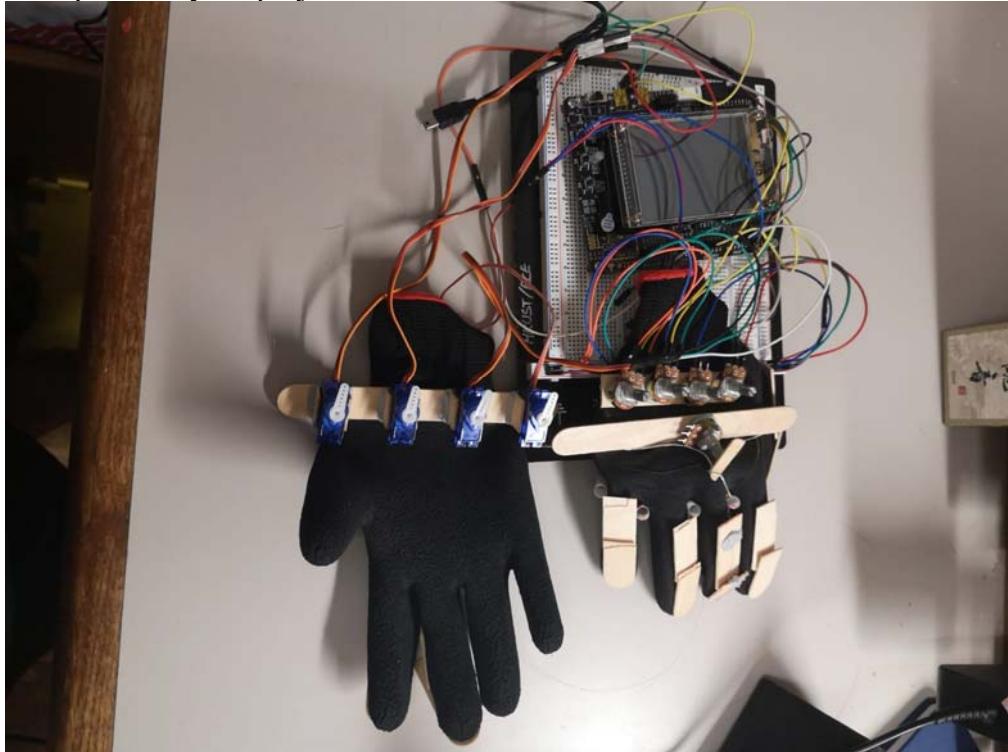
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Group Number	15
Project Title	Surveillance Vehicle
Name of Student 1	Yen Hao Zhi
Name of Student 2	Fung King Fai

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Detection of the hand movement by the accelerometer sensor
- To grab some light object
- Detect a degree of finger gesture
- Simulate the real hand movement

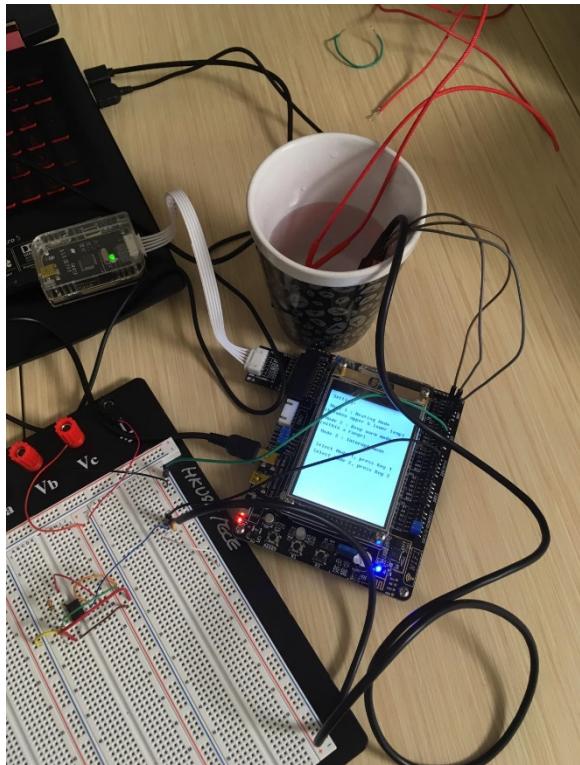
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Group Number	16
Project Title	Multifunctional Cup
Name of Student 1	Wong Tsz Ho
Name of Student 2	Chan Kai Yiu

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Measure with the water level sensor and the water temperature sensor(DS18B20)
- Using LCD Display for showing the information
- Pressing the keys to set the upper and lower temperature
- Using 2 7-segments to show the real-time temperature of the water
- Using an external switch for the interrupt mode i.e. when pressing that switch, the heater will turn on
- 3 different modes that control the temperature by using the heater in different situation

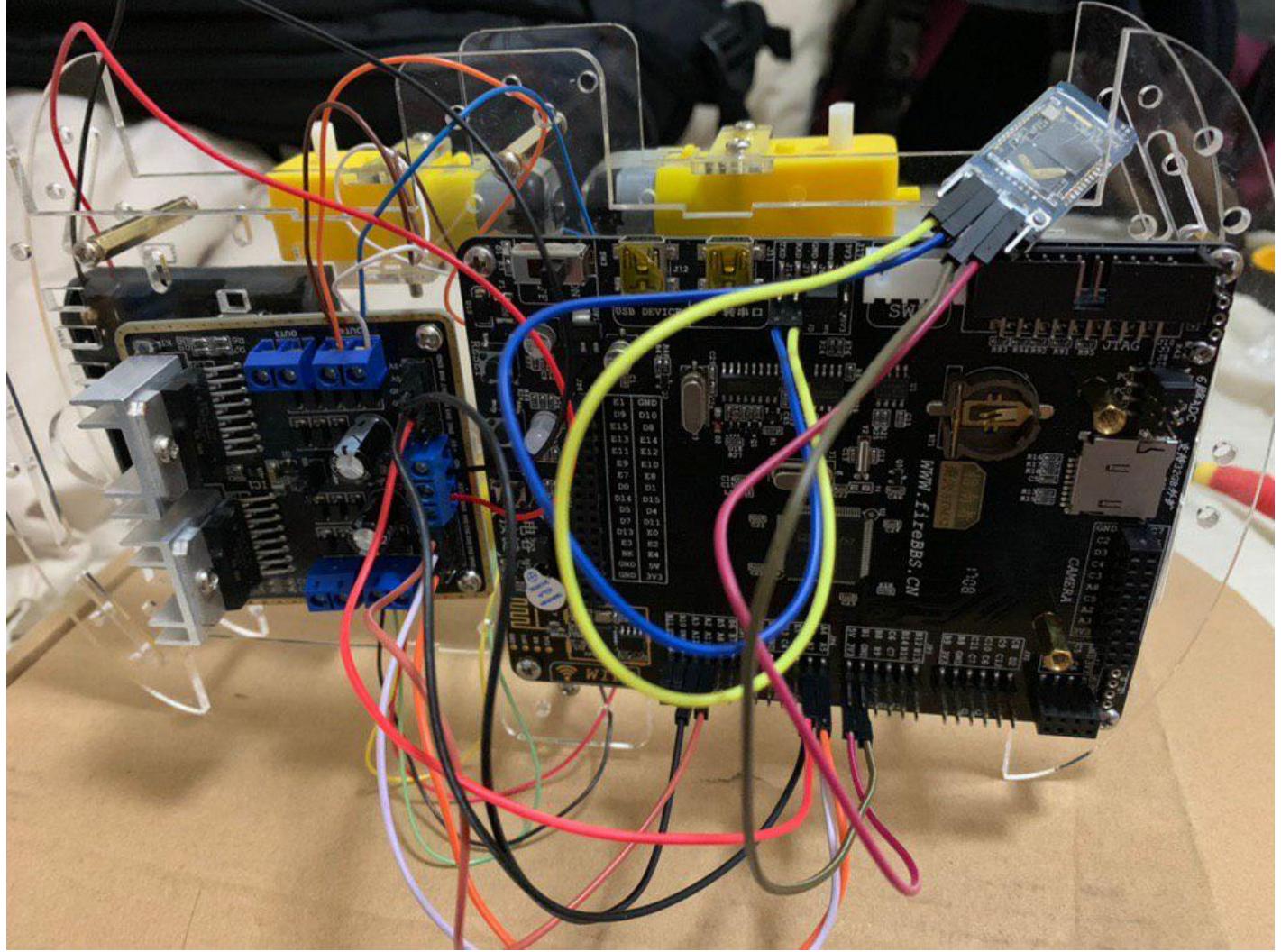
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Group Number	17
Project Title	Wireless Remote Car
Name of Student 1	Shuen Tak Wai
Name of Student 2	Ng Ka Ho

Please attach ONE photo of your project here



Please list the functions of your project in point form

- The STM32 controller will act as a receiver of commands from the user and decide the movement of the car.
- The car is able to move forward, turn left or right or going backward
- Use gamepad on PC for controlling,
- Movements and sheering are made by the MCU controlling the PWM of motors the car.

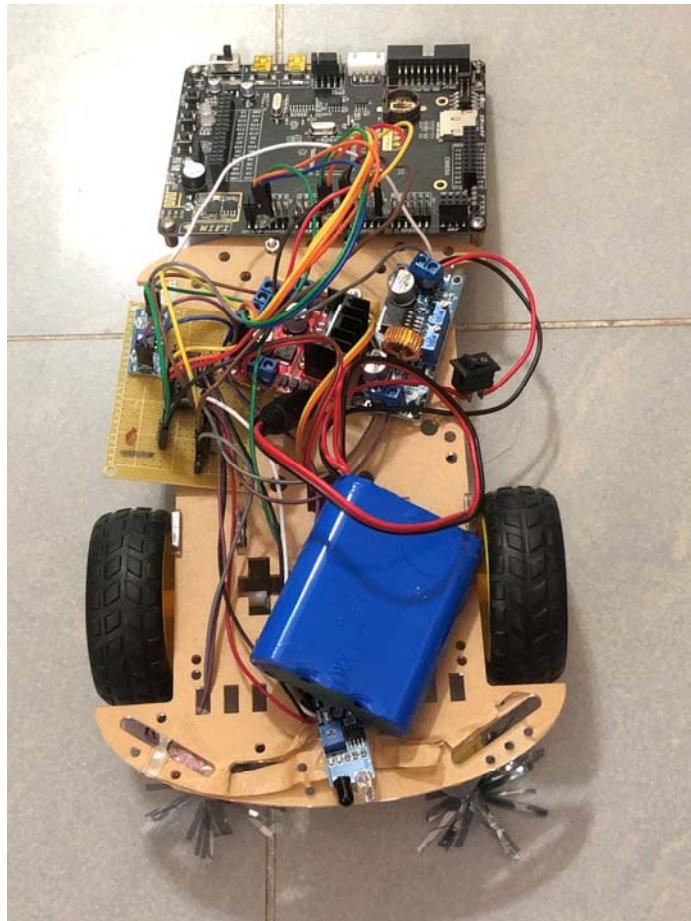
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Group Number	18
Project Title	Automatic Sweeping Car
Name of Student 1	Yeung Ho Pan
Name of Student 2	Lam Wai Sing

Please attach ONE photo of your project here



Please list the functions of your project in point form

- The car is always in auto mode when pressing the K1 button.
- Detecting the surround obstacle using an infrared sensor.
- Collision avoidance after analyzing the signal with STM32.
- Cleaning up the dust with two sweeping brush.
- Automatically car movement.
- Vacuuming with the fan at a fast speed.
- The car stop movement when pressing the K2 button.

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Group Number	19
Project Title	
Name of Student 1	LI, Chi Kin
Name of Student 2	CHAN, Yiu Kwong

Please attach ONE photo of your project here

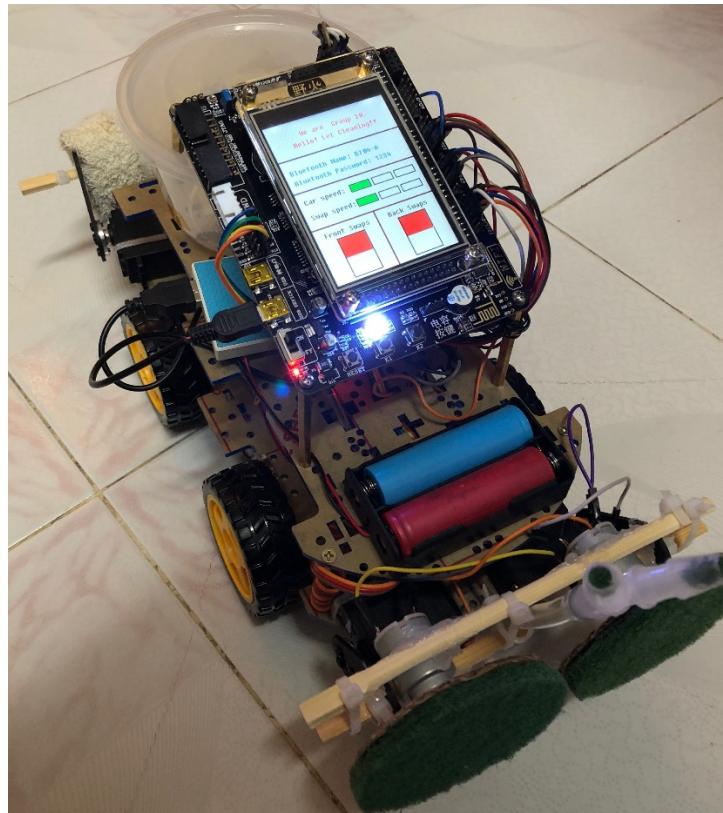
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Group Number	20
Project Title	<u>Cleaning swap robot</u>
Name of Student 1	Wan Chi Shing (20367961)
Name of Student 2	Tse Wing Hei (2044 6652)

Please attach ONE photo of your project here



Please list the functions of your project in point form

Objective: Floor cleaning

- Controlling the robot via Android apps (Bluetooth)
 - Movement (front, back, left, right, stop)
 - Speed controlling
 - Movement
 - Swap
- Colorful LCD display for the state and information of the robot
- Touch screen function in STM32 for changing state and speed
- Moveable swap
 - Upward
 - Downward (Auto run)
- Clean with water (water pump)

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Group Number	21
Project Title	Fitness Watch
Name of Student 1	BHANUSHALI, Tanmay
Name of Student 2	MEHTA, Akshat

Please attach ONE photo of your project here

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Group Number	22 (Use other MCU)
Project Title	Water Land Air Drone
Name of Student 1	HUI KA YIU
Name of Student 2	HO WING KI

Please attach ONE photo of your project here



Please list the functions of your project in point form

- 4 Brushless motors and ESCs to provide the thrust to fly or move on land/water (Timer PWM function).
- 4 Servo motors to turn the propellers to change mode (move forward/backward on ground/water, or fly)
- 6 channel radio controller for commanding the drone (Timer's input capture function)
- IMU and GPS for measuring angle and position for PID control. (UART, interrupt)
- Camera and SD card for saving images and logging flight information. (SPI, DCMI, DMA)
- TFT LCD screen for displaying important flight information. (SPI)
- TOF laser sensor for measuring vertical distance from the ground. (UART)

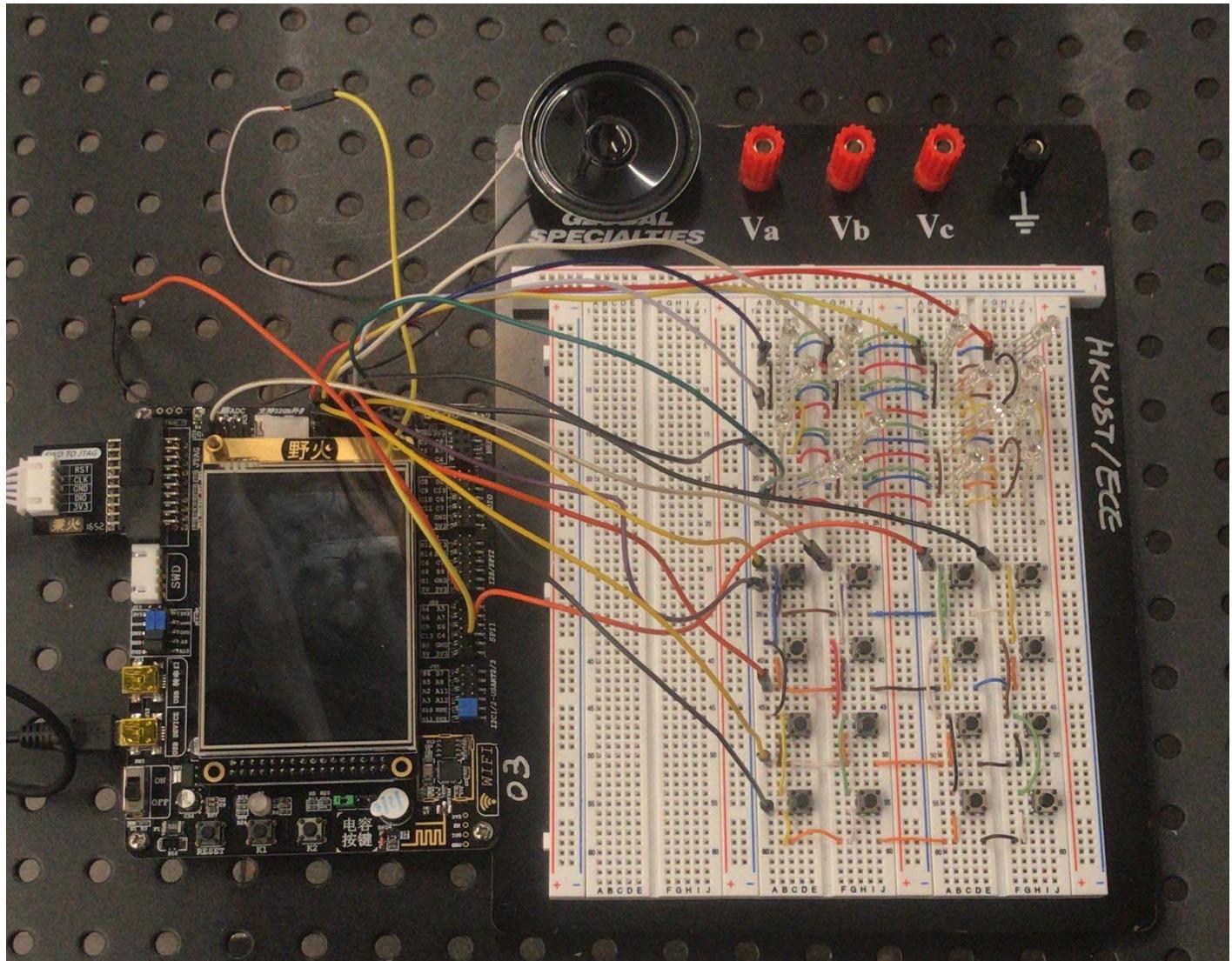
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Group Number	23
Project Title	Sound Mixer
Name of Student 1	Chow Chung Hin
Name of Student 2	Wong Ho Yan, Veronica

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Play audio file from SD card through a speaker
- LED lighting effects
- Trigger sound mixing function and LED lighting when the switch is pressed
- Have varies lighting effects like LED breathing
- Mix 2 sound files and output the result simultaneously
- LCD displays the information of the song and which switch triggers which sound effect

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Group Number	24 (Use other MCU)
Project Title	STM32 NES Emulator
Name of Student 1	Anshuman Medhi
Name of Student 2	Aaron Si-yuan Wang

Please attach ONE photo of your project here



Please list the functions of your project in point form:

- Nintendo Entertainment System emulator, capable of running classic NES games, such as Super Mario Bros, Donkey Kong, Battle City, etc.
- Accurate NES CPU emulation:
 - implementation of all 256 instructions and 6 registers of the 6502 processor
 - capable of reading and executing the ROM files accurately
 - manages the timing of each CPU instruction to ensure faithful emulation
 - includes the memory management of the 2KB internal RAM and the PPU, APU, and I/O registers
- Accurate NES PPU (Picture Processing Unit) emulation:
 - implementation of the image, sprite, background and color palettes, the pattern, attribute and name tables, the sprite RAM, and the 8 memory-mapped registers of the PPU
 - sprite and background rendering using accurate frame timings of the 262 scanlines
- Capable of 30 fps game graphics output onto a 3.2 inch TFT using SPI and double-buffer DMA
- Uses joysticks (ADC) and buttons (GPIO) on a custom PCB to handle user input (processed by the CPU)
- Includes an IMU for an alternate user input scheme (tilting to simulate the D-pad controls)
- APU (Audio Processing Unit) emulation using op-amps, DAC, and PWM to emulate the 5 channel sound outputs
- Uses an SD card to store and load ROM files of multiple games simultaneously (each ROM file is 40KB)
- Includes a menu screen to allow user to easily select or switch games

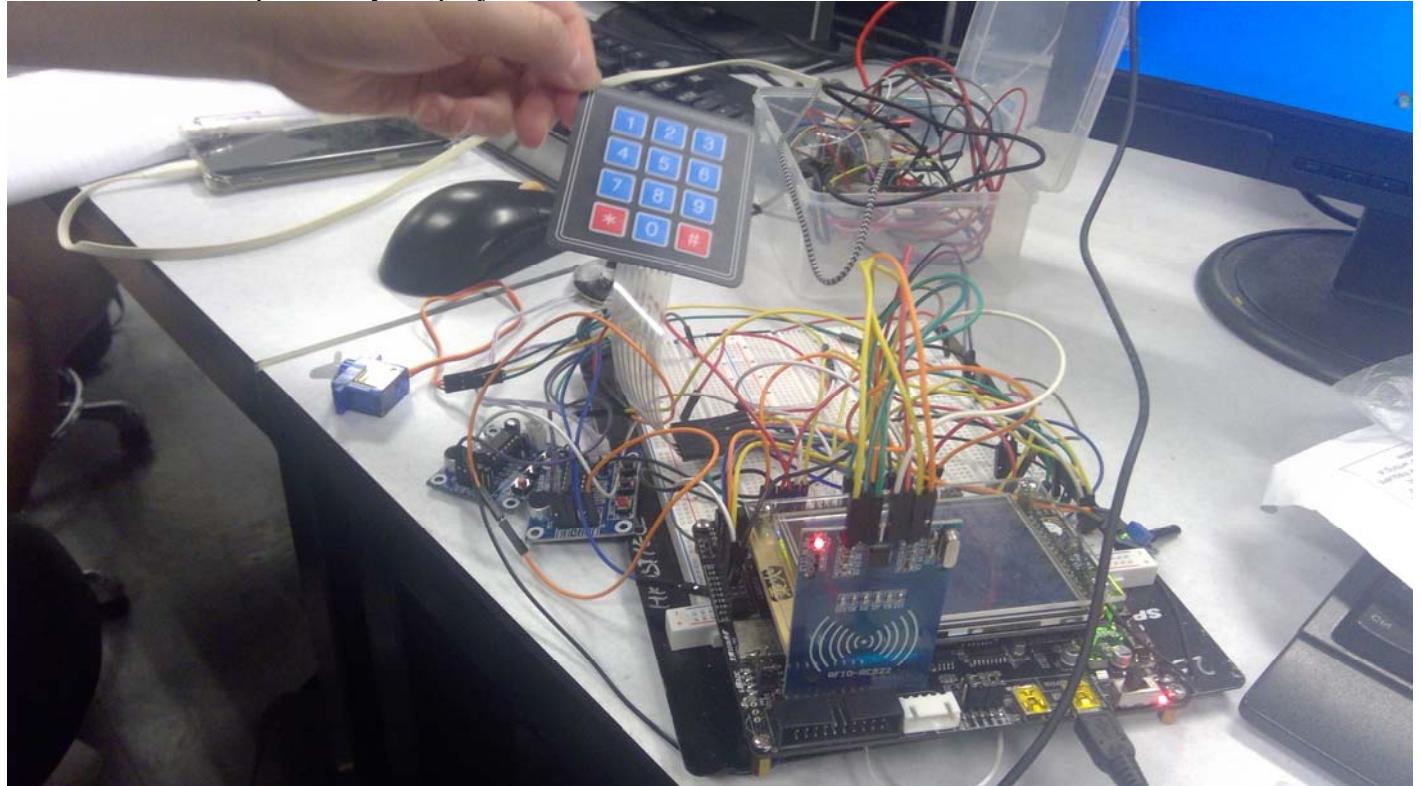
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Group Number	25
Project Title	Security Digital lock
Name of Student 1	CHAU WENG UN
Name of Student 2	

Please attach ONE photo of your project here



Please list the functions of your project in point form

- LCD User Interface
- 3x4 keypad for menu and password input
- Unlock function with 3x4 keypad and RC522 RFID module (SPI interface)
- Intrusion prevention(shock sensor and input errors limit)
- Conversation and record function (ISD1820)
- Buzzer reminder
- Locked and RESET functions

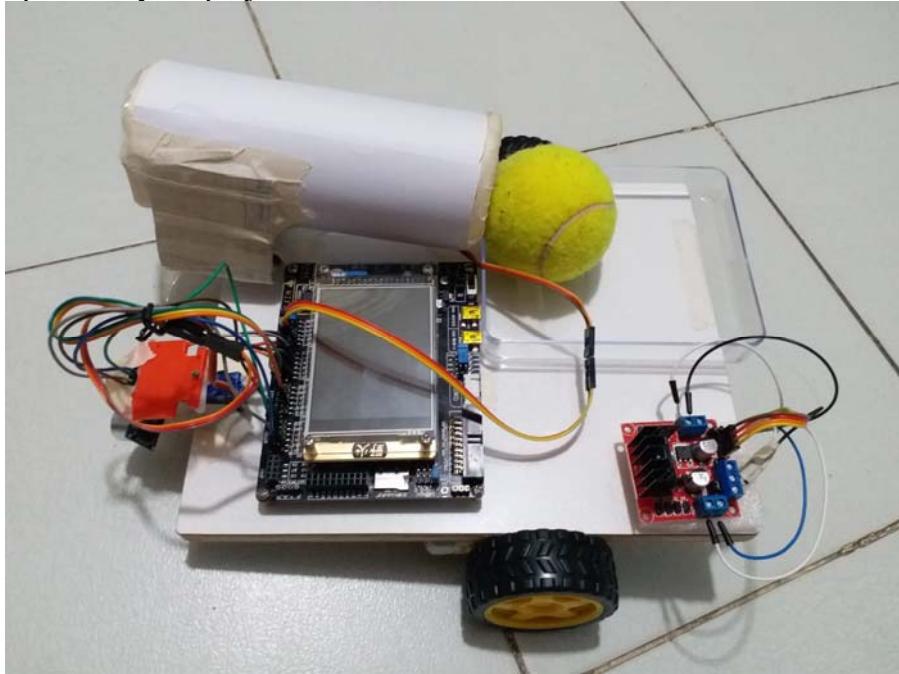
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Group Number	26
Project Title	Table Tennis Ball Collector
Name of Student 1	CHOW, Tsz Ki
Name of Student 2	TSE, Yan Tung

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Ultrasonic sensor: input signal, used to sense the location of ball by converting the sum of transmitting time and receiving time of signal into the distance
- Servo motor equipped on sensor: input signal, rotating ultrasonic sensor from 0 to 180 degree, in order to sense the nearest ball in front of the car
- Color sensor: input signal, used to identify whether the ball sensed is the targeted colored ball
- DC motor with wheels: output, used to move the car to the corresponding position, for example, when the sensor senses the ball, the distance between the ball and car, as well as the rotated degree of servo motor are recorded. If the degree is equal to 90, the car goes straight. If it is less than 90, the car is going to turn left, otherwise, it turns right. The speed of wheel is changed by the PWM. When the car turn left, the right wheel move faster than the left one (i.e. the speed of left wheel is slower than normal speed), vice versa.
- STM32: microcontroller, used to record and organize the input signal, and then control the speed of wheels to turn and move the car
- Servo motor for collecting the ball: output, collect the ball with a tube placed on the servo motor after the car moves in the front of the ball

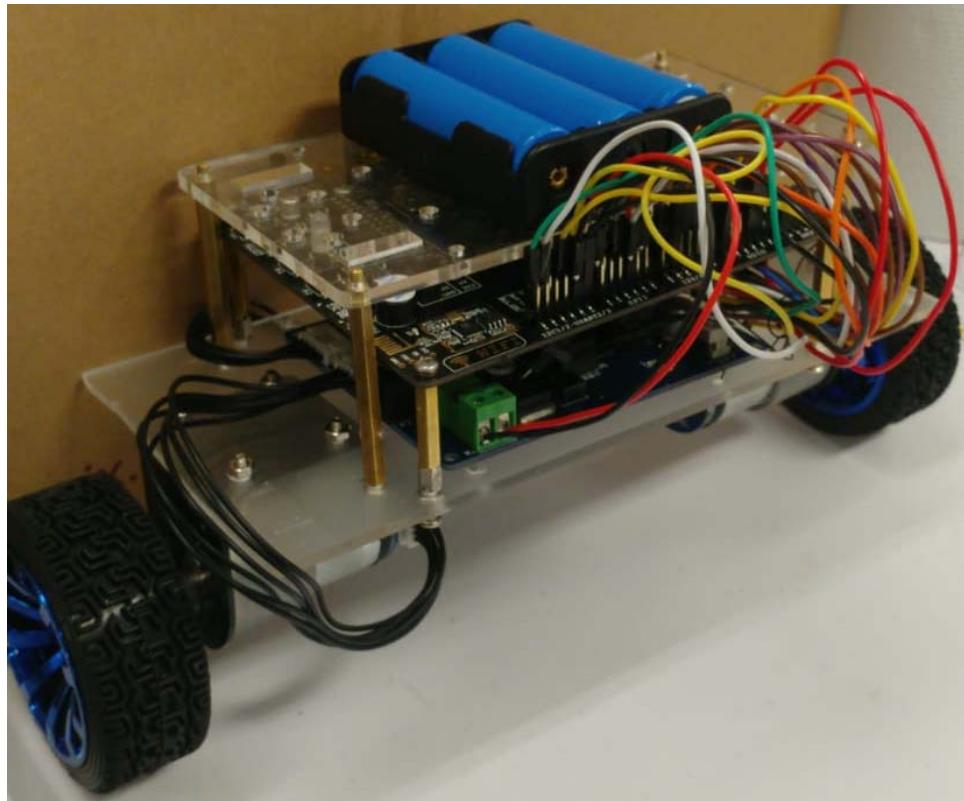
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Group Number	27
Project Title	Self-balance car
Name of Student 1	Chan Tai Wai
Name of Student 2	Yeung Lik Kan

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Self-balance
- Bluetooth control by mobile phone that can move forward, backward, turn left and turn right
-

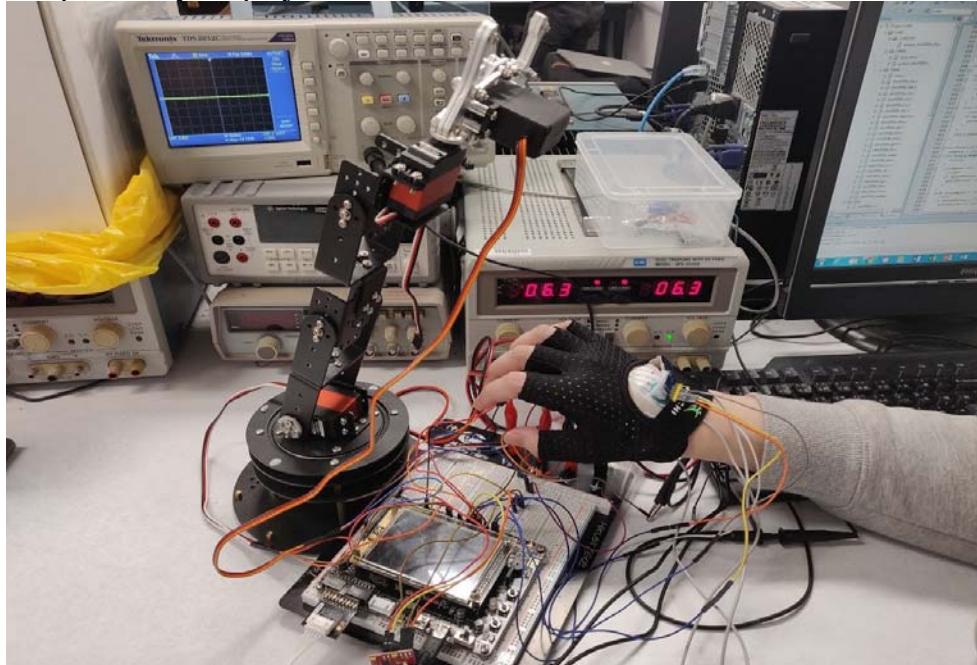
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Group Number	28
Project Title	Gesture-Controlled Robotic Arm
Name of Student 1	Lo Yuen Shan 20433485
Name of Student 2	Yeung Ho Hin 20420660

Please attach ONE photo of your project here



Please list the functions of your project in point form

- **Using Muscle Sensor and data obtained from Accelerometer as INPUT. STM32 will process the data obtained and change the motions of servo motors located in different part of the robotic arm.**
 - Accelerometer: Up and Down movement of the arm, base Rotation
 - Muscle Sensor: Open and Close motion of the gripper
- **Electromyography (EMG) Muscle Sensor v3.0:**
 - 3 snap connectors are placed in the hands
 - Open: 0V; Grabbing motion: above 100 mV
 - Set the program when V>=100mv, the gripper will continue closing
- **Accelerometer (MPU6050):**
 - Provide x, y, z coordinate as raw data
 - Compare with previous state with the program in microcontroller control motion.
 - Changes in z-axis: Up and Down; Changes in x-axis: base Rotation
- **Servo Motor: Control the movement of whole arm**
 - Gripper (TBSN-K15): Control the gripper (max. 15kg)
 - Arm (TBS2701): Control the forward and backward motion
 - Base (TBS2701): Control the rotation of the base
- **LCD Display: Display the instructions**
 - Button Reset: Reset the arm to the default position
 - Button K1: Change the State to Ready
 - Button K2: Change the State to Stop

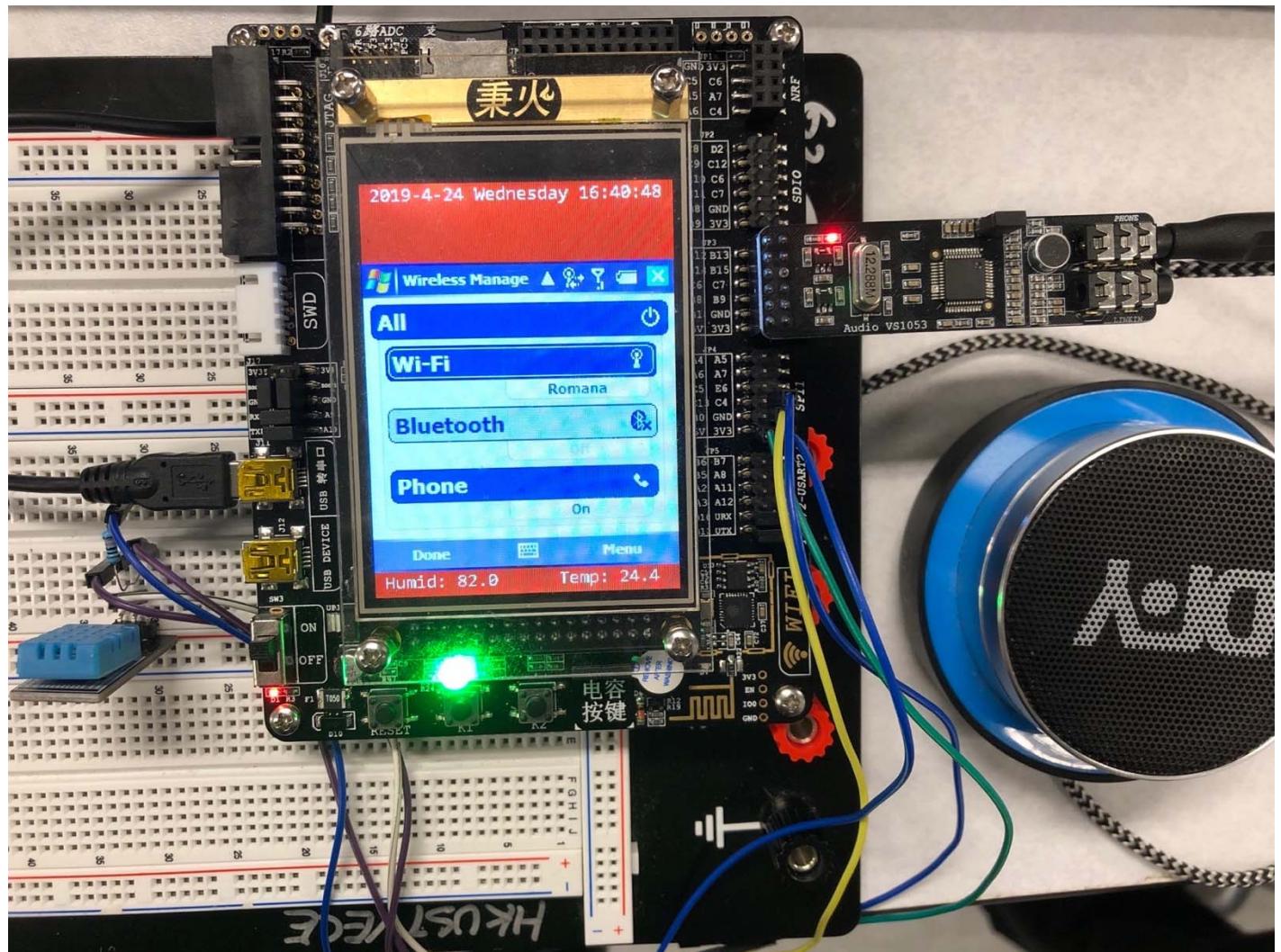
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	29
Project Title	Home Entertainment System
Name of Student 1	Ng Ying Lung
Name of Student 2	Yiu Chun Kit

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Measure the temperature and humidity via DHT11
- Generate warning when temperature over user's input level
- Display system time using RTC
- Access files stored in the micro-sd card
- Digital Photo Frame (Display BMP format images)
- Music Player (Play MP3 music through VS1053b)

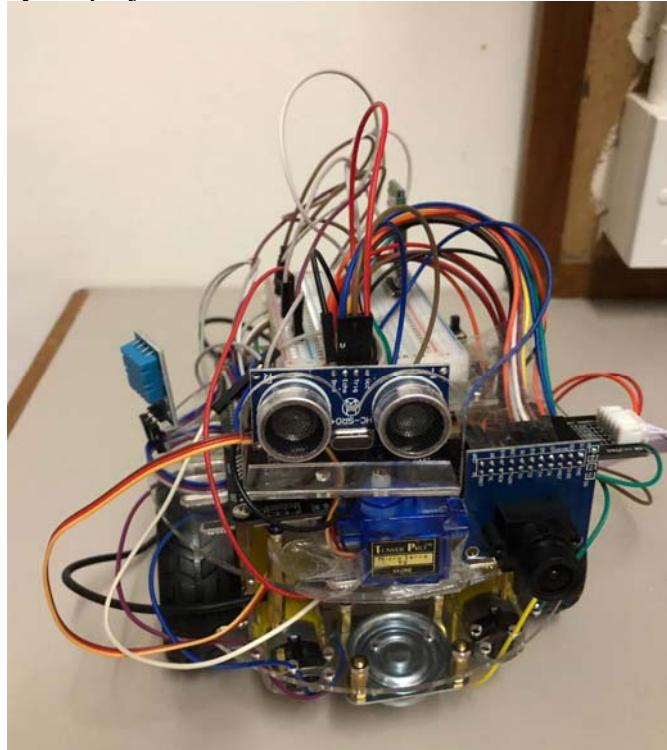
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	30
Project Title	Surveillance Vehicle
Name of Student 1	Lam Hong
Name of Student 2	Chu Ho Nam

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Random roaming mode: it will avoid the obstacles detected by the HC-SR04 ultrasonic sensor
- Manual mode: user can manually control the movement of the car through mobile app by using HC-05 Bluetooth Module
- Connect the SG90 Servo motor together with ultrasonic sensor in order to turn around for barrier detection
- Temperature and humidity sensing by using DHT11 Humidity & Temperature sensors
- Record the environment by using OV7670 Camera Module to take pictures
- Data connected from camera and DHT11 sensors will be stored in the SD card

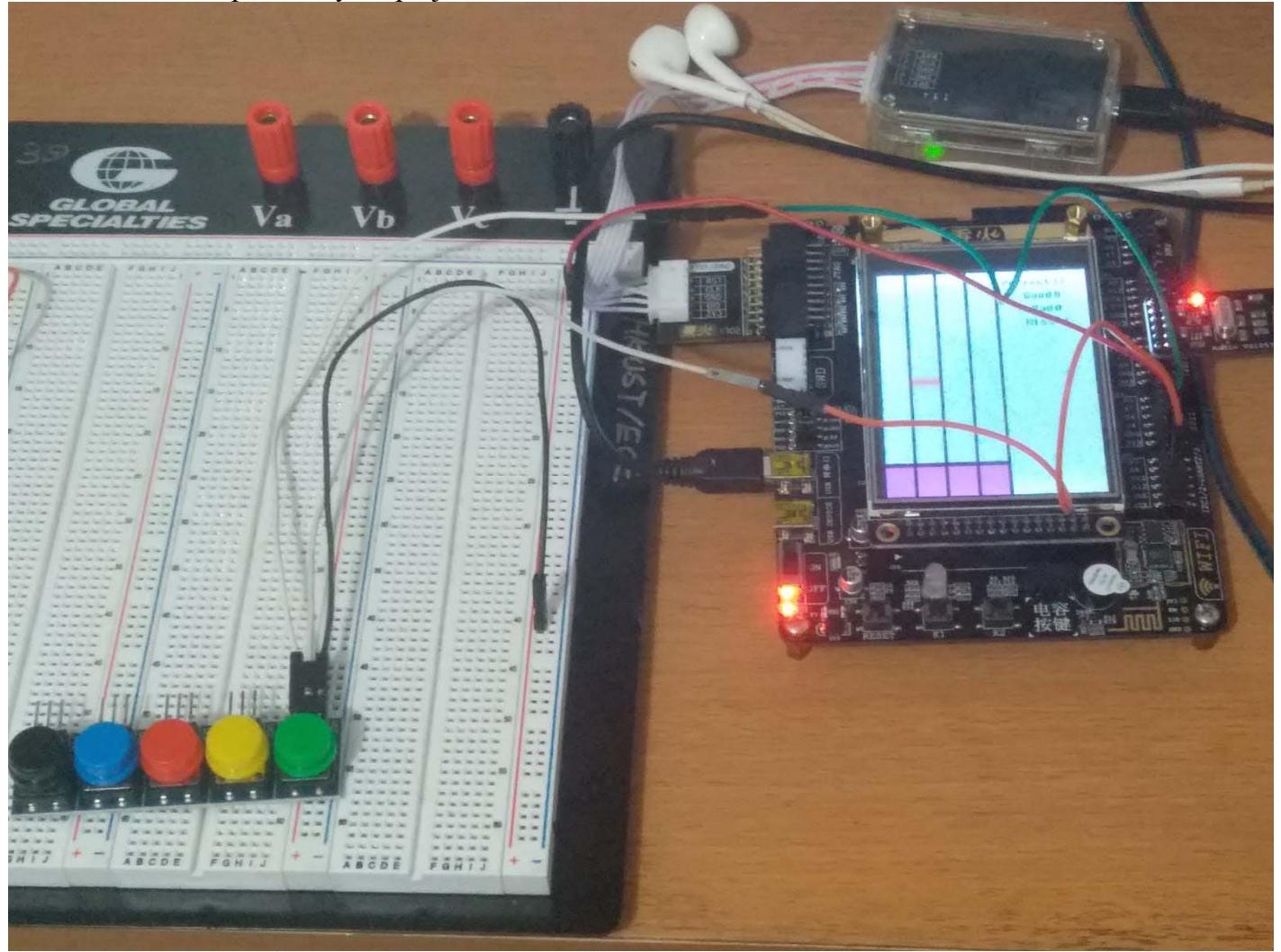
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	31
Project Title	Rhythm Game
Name of Student 1	Wu Wang Hin
Name of Student 2	Kong Tsun Hin

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Rhythm game shown by the LCD
- Press buttons in a sequence dictated on the screen
- Increases the player's score when buttons are press in the correct timing.
- Three gradings: 'good' , 'ok' , 'miss' will feedback to the players about the timing of button pressed.

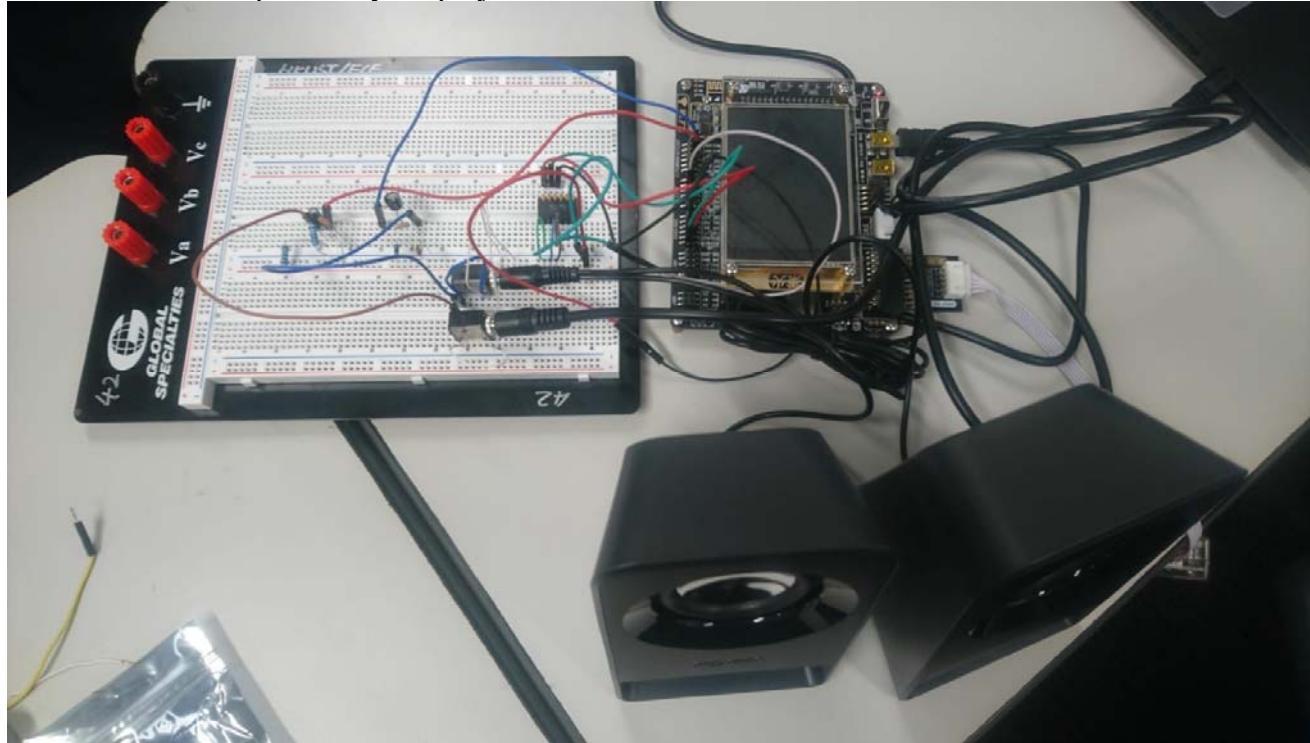
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	32
Project Title	Real Time Digital Signal Processing Audio Project
Name of Student 1	Lee Pan Yin
Name of Student 2	Lim Chung Wai

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Get song input from phone or other devices by 3.5mm jack
- Adding audio effect like changing the pitch by process the digital signal of the song using STM32
- Output the processed song using speaker by 3.5mm jack

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	Group 33
Project Title	Robotic hand
Name of Student 1	Ng Ki Lok Evan
Name of Student 2	Ruyer Jorel Eric

Please attach ONE photo of your project here

Please list the functions of your project in point form

- Sensing flexing action of the fingers using flex sensors
- Detect arm movement (rotation) using gyroscope sensors
- Generate corresponding PWM signals from the information of sensors and send to servomotors
- Perform flexing action of corresponding robotic fingers using servomotors
- Perform rotation of robotic arm using servomotors

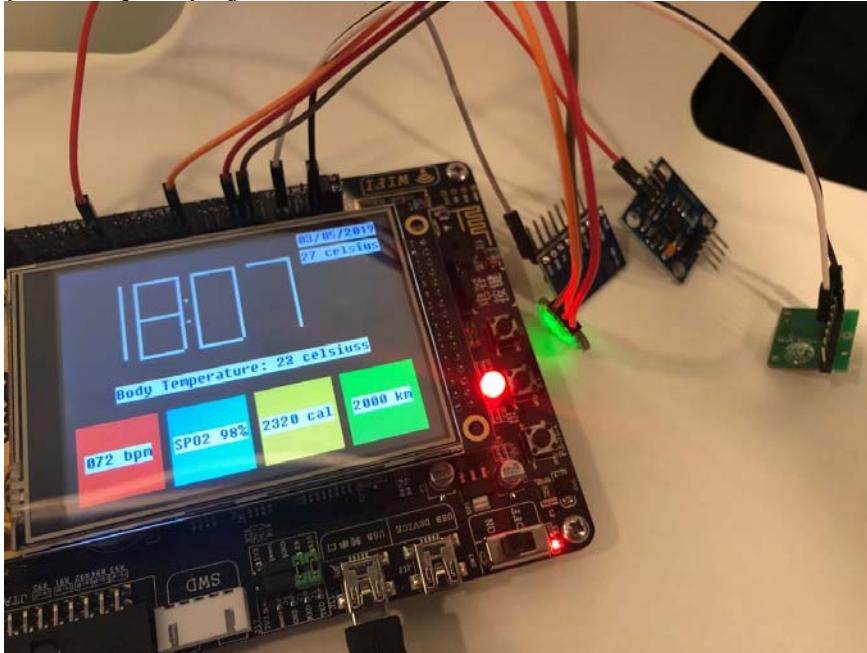
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	34
Project Title	Smart Watch
Name of Student 1	KU Calvin Jun-wei
Name of Student 2	Wong Christopher PK

Please attach ONE photo of your project here



Please list the functions of your project in point form

- A home screen that has
 - Digital Clock display that gets **local HK time** when startup and uses a **timer** as a continuation for calculating a time. As well as getting the **current weather** from Hong Kong Government's API using **Wi-fi** (ESP8266)
 - TCP/IP communication
 - A LM-35, **temperature sensor** that can get current **room temperature** and your **body temperature** if you put it on your body.
 - ADC communication
 - A **Pulse sensor** to measure your **heartbeat**
 - ADC communication
 - A **blood oxygen** level sensor (MAX30102) that measures your **oxygen level**
 - I²C communication
 - Using **Triple Axis Accelerometer** (ADXL345), **3 axis Gyro** (GY50) and **Compass** (GY-271) to calculate **distance** and **calories burnt**.
 - I²C communication
- The LCD is a **touch screen**, if click on the red square (heart rate), it would redirect to a new screen that shows a **graph of your heart rate pulse**. And a **graph of SPO2** would be shown if the blue square is clicked.
- Self-implemented **DMA** for switching between multiple ADC of temperature and pulse sensor.

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	35
Project Title	Drone
Name of Student 1	LAW, Man Hei
Name of Student 2	SIU, Wai Lok

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Quadcopter Drone. 4 Motors
- Bluetooth Control with HC-05 (Left, Right, Forward, Backward, Upward, Downward)
- Measuring its position with HMC 5883 of GY-80
- Auto-balancing using data from HMC 5883. Drone would auto-correct to prevent rotations and flips
- Manually control respective motor speeds

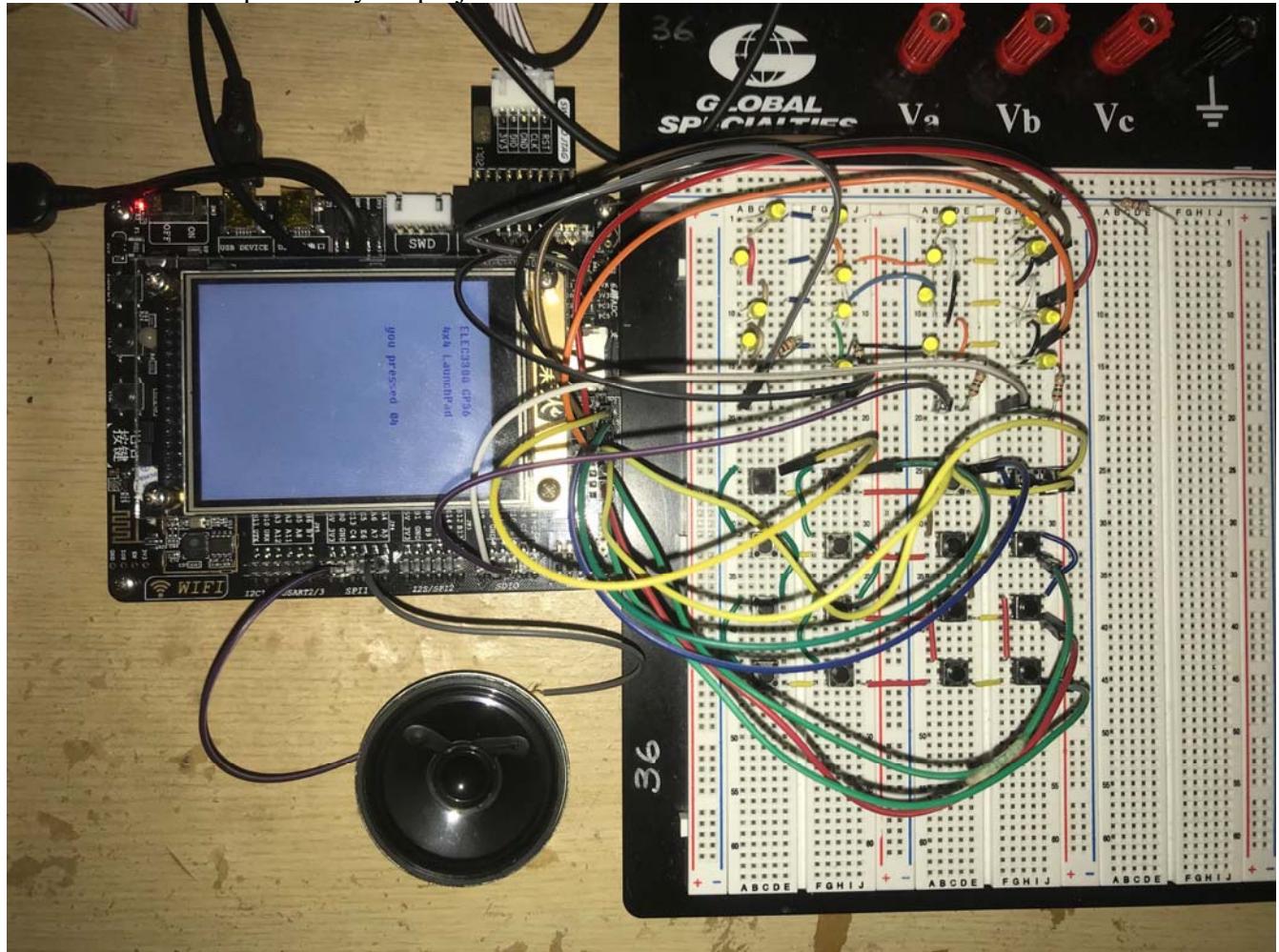
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	Group 36
Project Title	DIY Launchpad
Name of Student 1	So Kam Yun
Name of Student 2	Li Rui Fung

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Able to generate 16 different LED matrix patterns
- Able to play 16 different soundtracks
- Include a user interface to show which button did the user press

ELEC 3300 Project Summary Sheet

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Group Number	37
Project Title	Remote Gift Box
Name of Student 1	Kwok Chung Sum
Name of Student 2	

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Time/date retain even if power cut by RTC
- Surrounding humidity and temperature readings via DHT11

Internet functions via ESP8266 Wi-Fi through UART:

- Weather information gathered from HKO
- NTP time calibration
- Remotely (un)lockable through web interface over Internet
- Remote messages and melodies
- Speaker output for seasonal melodies
- Mic input for voice reply

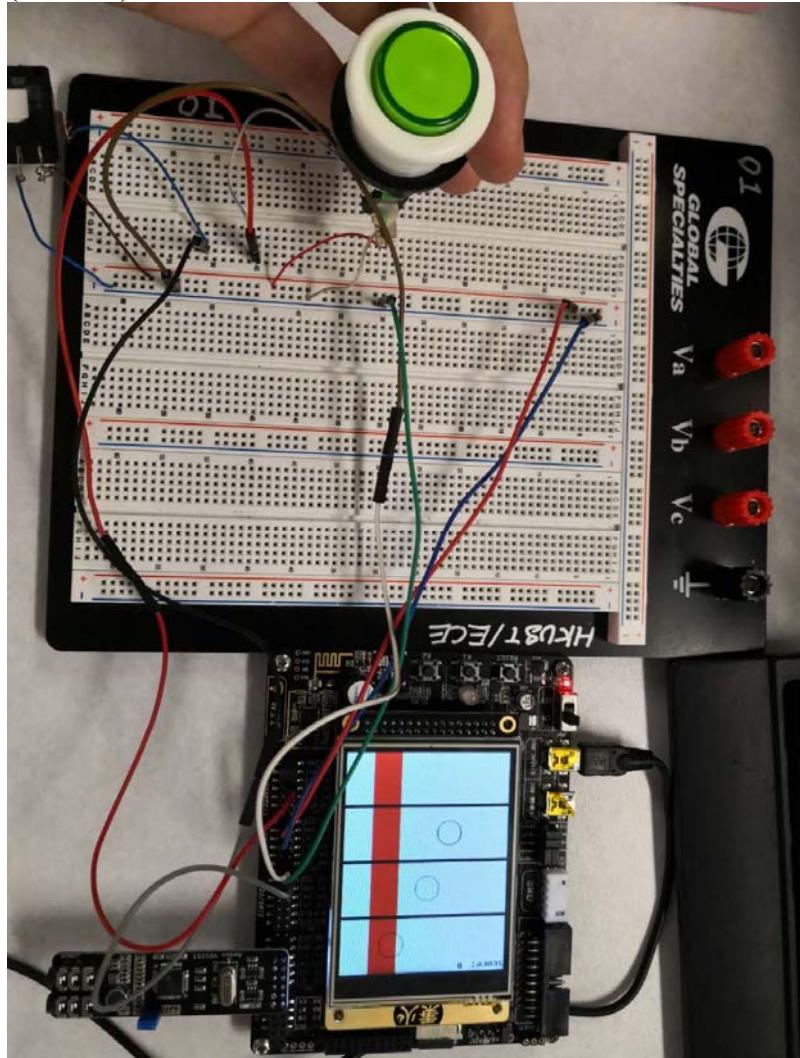
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	38
Project Title	Music Game (with beating)
Name of Student 1	CHEUNG HOI KIT
Name of Student 2	CHIU CHIU CHEUNG

Please attach ONE photo of your project here
(fill later)



Please list the functions of your project in point form

- Play music that selected by players which saved in the gaming machine.
- The LCD will show all the information about the game.
- The screen will show up circles and bars relative to the beats on the music.
- Players hit the buttons as long as the circles and bars arrive at the certain regions
- Score will be calculated on the screen.

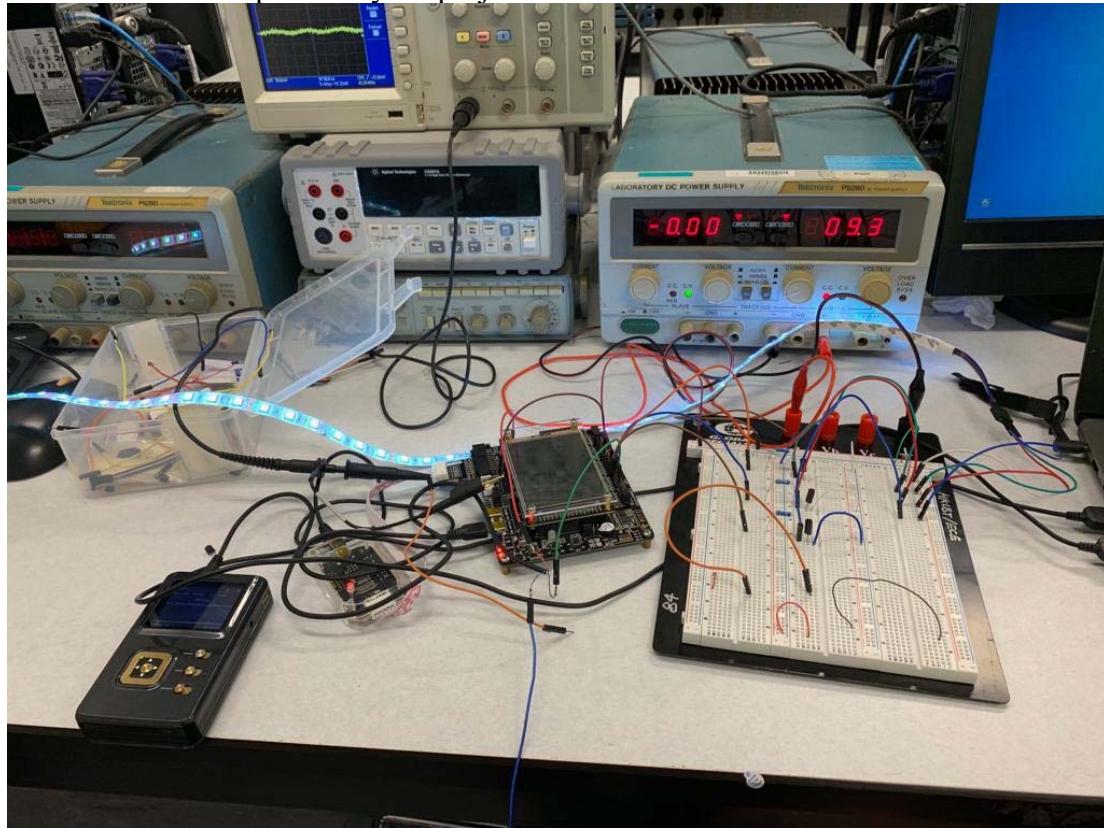
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	39
Project Title	Mini Musician
Name of Student 1	Chan Pak Long
Name of Student 2	Ng Yip Chu

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Get analog audio input from mp3 player
- Analyze the data using Fast Fourier Transform (FFT) method to distinguish different frequencies
- Output different LED colors corresponding to different frequencies

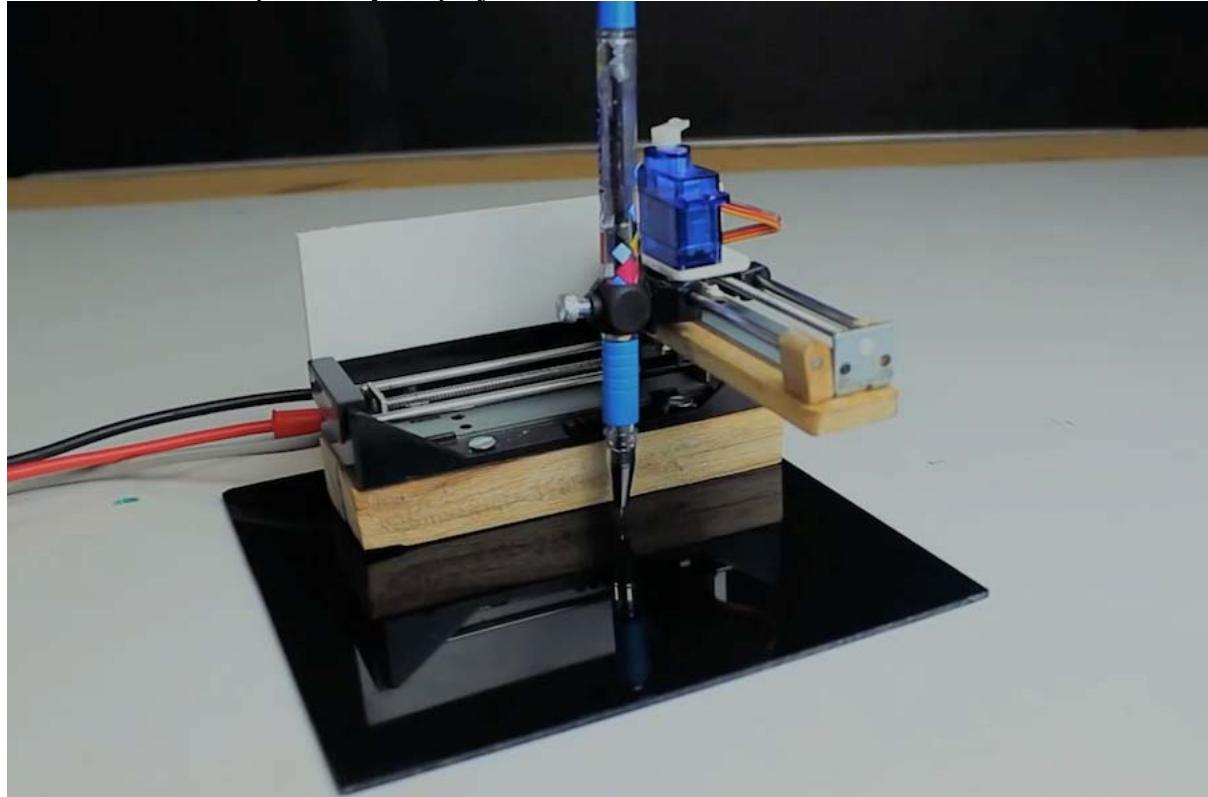
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	40
Project Title	Drawing machine
Name of Student 1	HO Ka Tak
Name of Student 2	MOK Chun Hei

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Draw some patterns on the LCD touch screen, and the trajectory will be displayed on the screen.
- The STM32 will control two stepper motor, move the pen to the path on the LCD touch screen.
- The sensor will sense if there is paper under the pen, and the STM32 will control the servo motor to let the pen contact the paper if there is paper under the pen. And draw something on the paper

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	41
Project Title	Holograms fan
Name of Student 1	LEE Lok Yin
Name of Student 2	

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Read SD card image by SPI
- TFT display manual by SPI DMA
- Button control for control manual by GPIO input
- Temperature and humidity sensor by I2C
- Count time, date, years as a multi-function alarm clock by Timer
- Bluetooth remote control for changing display mode and clock by UART
- Full color LEDs separately control by a serials GPIO output
- Buzzer alarm as different sound by ADC
- Control motor for constants speed by PID
- Optical encoder for positioning by Timer encoder mode
- Light sensor for position recalibration by GPIO input
- Hologram display as clock or image display

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	44
Project Title	Smart Counter Claw Machine
Name of Student 1	Wong Long Kuen Billy
Name of Student 2	Wong Shu Yiu

Please attach ONE photo of your project here



Please list the functions of your project in point form

- **Controlling the movement and grabbing motion of claw in x, y, z directions using motors.**
Three stepper motors with metal sticks are used for the three directions.
DM542 motor drivers are used to drive the motors.
Player use one controller stick; the movement of controller stick sends directional signal to STM32 and output instructing the motors to move in xy directions.
The z direction claw will be as same as the xy direction configurations.
- **Looping Music and sound effects corresponding to specific motions.**
Music starts when the player presses the initiating button.
Sound effects are plays simultaneously when objects delivered to the container.
- **Counts for time left and the number of objects delivered successfully to the designated container.**
The LCD board and timer built in of the STM32 shows the numbers.
Timer set to be 3 minutes.
Infrared sensors are used to detect object falling down the container.

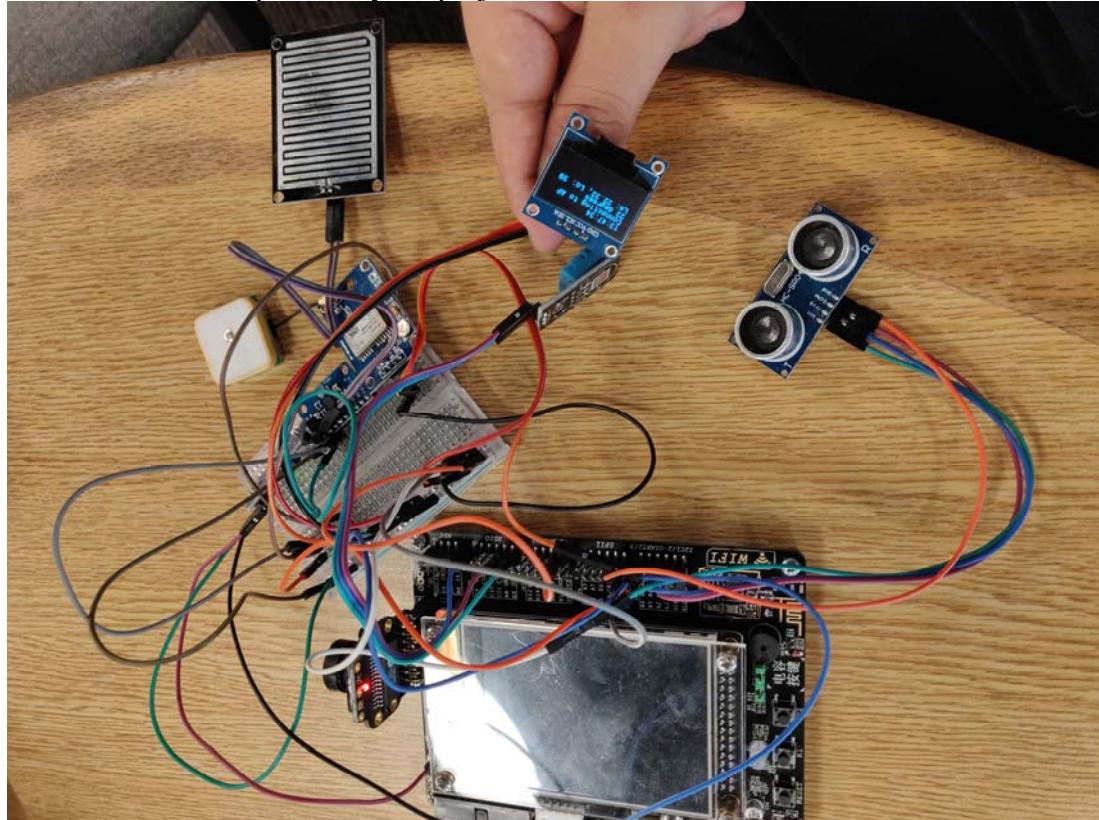
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	45
Project Title	Smart Glass
Name of Student 1	SUN, David
Name of Student 2	DUNDA, Gerry Windiarto Mohamad

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Provide bikers access to useful data in the form of smart glass
- Show all data using OLED Screen interfaced with i2c
- Get current weather data from Hong Kong observatory API, using ESP8266
- Get current position in latitude and longitude using GPS module
- Get current orientation and acceleration using MPU 6050
- Get local temperature and humidity using DHT11 sensor
- Capture and save images taken from camera to SD card
- Get current time using RTC (Real Time Clock) and interrupts
- Get Object distances using HC-SR04 ultrasonic sensor
- Detect sweat using moisture sensor using ADC
- Set preferences and time using buttons
- Provide biker alert using buzzer if he/she went over a certain acceleration threshold

ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	46
Project Title	Powered exoskeleton
Name of Student 1	OU,yuping
Name of Student 2	MA, kamming

Please attach ONE photo of your project here

Please list the functions of your project in point form

- The LCD display is used as input, there are several options, you can take them from touching the LCD screen. Those options are considered as input and it will send it to MCU for analysis.
- MCU is the controller, there are many different uses of algorithm, including the various display in LCD and compute the optimal value for output. Once, it obtains the input data, MCU will calculate the output and send it to the powered exoskeleton
- Powered exoskeleton is combined with various sensors, several motors and some tubes to simulate as a powered exoskeleton, the move commands are obtained from the result from MCU.

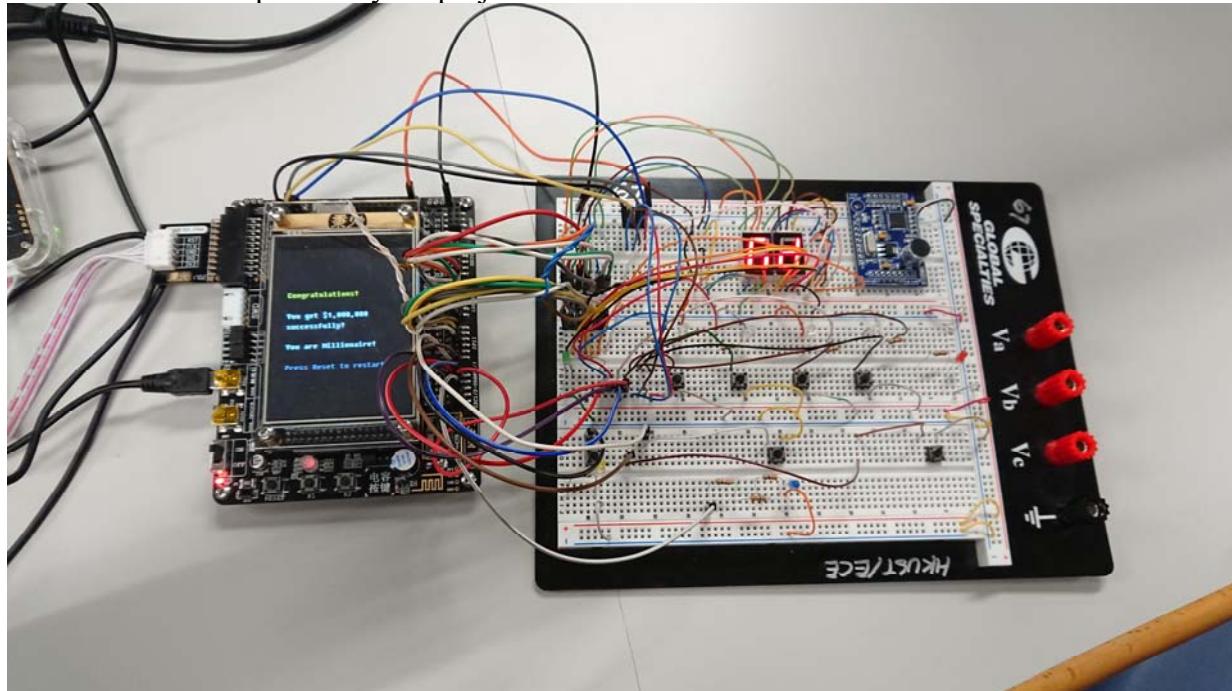
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	47
Project Title	Millionaire Game Console
Name of Student 1	Fong Lam Hang
Name of Student 2	Li Yuk Ting

Please attach ONE photo of your project here



Please list the functions of your project in point form

Hardware

- Display game interface (questions, choices and other information) using LCD
- Display time left of each level using 7-segment LEDs
- Input answer by voice recognition using LDV7 via USART, or 5 buttons.
- Indicate selected answer choice (A, B, C and D) or give-up choice using 5 LEDs
- Submit selected answer choice (A, B, C and D) or give-up choice using 1 button.
- Get only one hint (half elimination) during whole game using 1 button.
- Show the availability of hint using 1 LED.
- Show the correctness of the choice using 2 LEDs.
- Display light effect when victory or game over using 7 LEDs.

Software

- Similar game logic as classic TV show's – "Who Wants to Be a Millionaire?"
- Implement time limit in each round.
- Implement cash accumulation, safety nets and hint.
- Generate questions in random pick.

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	48
Project Title	Smart Home Automation System
Name of Student 1	CHENG, Chee Hau Calvin
Name of Student 2	LIU, Ho Yin

Please attach ONE photo of your project here



Please list the functions of your project in point form

- **RFID module (RTC522) for card recognition and the servo to control the opening / closing of door**
 - If the card number matched
The LCD will display “Welcome Home!”. The servo will turn 90° which act like a lock to open the door
 - If the card number not matched
The LCD will display “Access Denied! Please Try Again!”. The servo will keep at the same position without any turn
- **Use built-in Real Time Clock (RTC) to display the certain time on the LCD**
- Using DHT11 sensor to obtain outside temperature and humidity (GPIO)
- Users can use the integrated LCD screen to control and display the functions of the smart home system
 - Manually turn on lights and fans
 - Add / delete user for the facial detection camera at the door
 - Control fan speed manually
 - Modify and input correct digit password for alarm system
 - Display the current temperature and relative humidity
 - Lock and unlock door manually
- Using photoresistors to determine the outside lighting conditions (day / night)
- Use a relay module to turn on lights and other electronics

ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	49
Project Title	Gaming with Spinning LED Display
Name of Student 1	Wong Chun Wing
Name of Student 2	Chan Kam Sing

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Choose Spinning LED Display mode or LCD mode
- Able to show every English letter and number on Spinning LED Display
- Show a simple game on Spinning LED Display and control game character with Bluetooth
- Play a more complicated game on LCD and control game character with Bluetooth
 - The game has a random pattern and randomly generate events
 - Player can choose game difficulties
 - Player character and Computer character can move or shoot
 - Player character and Computer can pick up item when their bullet hit it

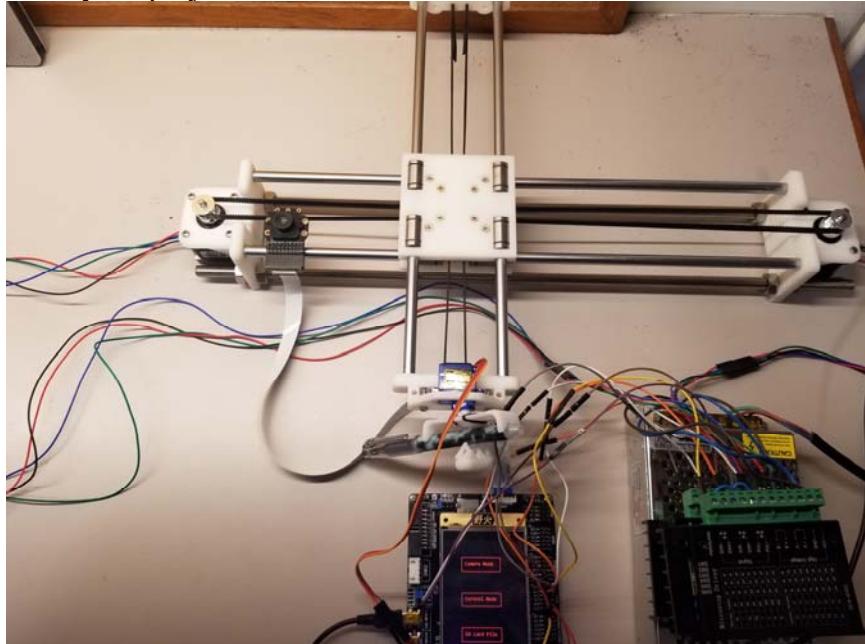
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	Group 50
Project Title	Auto Drawing Machine
Name of Student 1	DU Yinwei
Name of Student 2	CHEN Yi

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Use two Nema17 stepper motor to control the x and y movement of the pen
- Use one SG90 servomotor to control the writing angle of the pen
- Use the LCD screen to display information and enable user to give instructions by touching the screen
- Use an OV7725 camera for user to take picture of an object.
- Implement a FAT file system in SD card, which can store the path information for the stepper motor as well as store the picture taken in the previous point.
- Use HC05 Bluetooth module for communication between STM32 and laptops.
- On laptop, we use MATLAB to transform an RGB picture first to halftone black and white picture. Then do a nearest neighbor search to find the approximate path for the pen.\
- Overall, our drawing machine works in 3 modes:
 - Manual mode:
The user can control the pen's position and angle directly by touching on the screen.
 - SD Card Mode:
The machine will read a pre-stored txt file in the SD card and draw a picture based on that file
 - Camera Mode:
The user can take a picture using a camera and then send the file to the laptop for further processing. After that, a text file will be sent back to STM32 and the machine will draw a picture based on that.

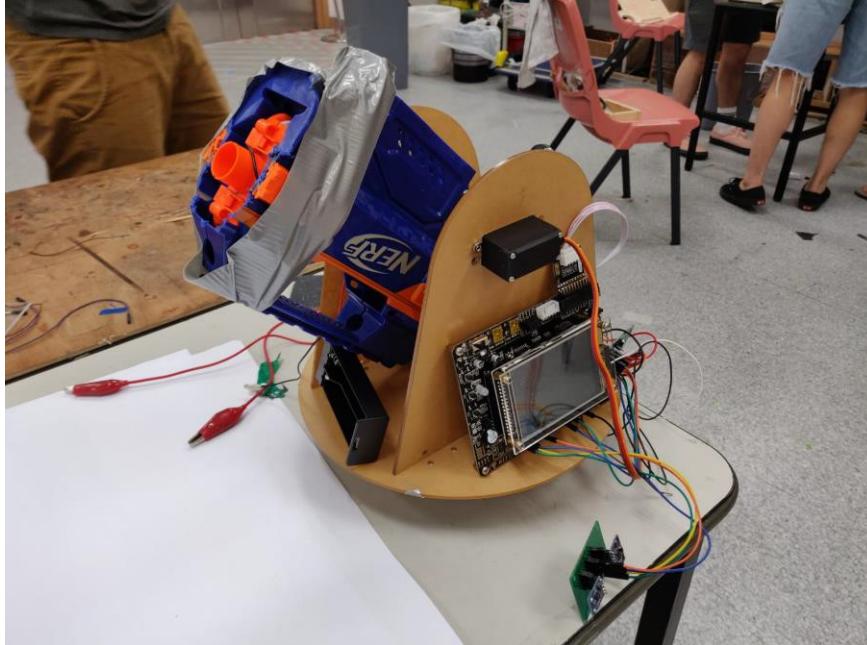
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	51
Project Title	Gesture Controlled Robotic Turret
Name of Student 1	JADOON, Asfandyar Khan
Name of Student 2	YONG, Vi Jun Sean

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Calibrate relative north 0° angle for user's arm with reading from QMC5883L Digital Compass to center the turret upon use
- Actuate turret X-Y pan axis rotation via QMC5883L Digital Compass readings using I2C.
- Actuate turret XY-Z tilt axis rotation via MPU6050 Accelerometer readings using I2C
- Start up Nerf gun motor and trigger bullet pushing mechanism via magnetic relays
- Remotely trigger turret functions on a turret controller STM32 from a glove-mounted STM32 via NRF2401L Modules
- Display turret motion information on LCD 1602 display via I2C module.

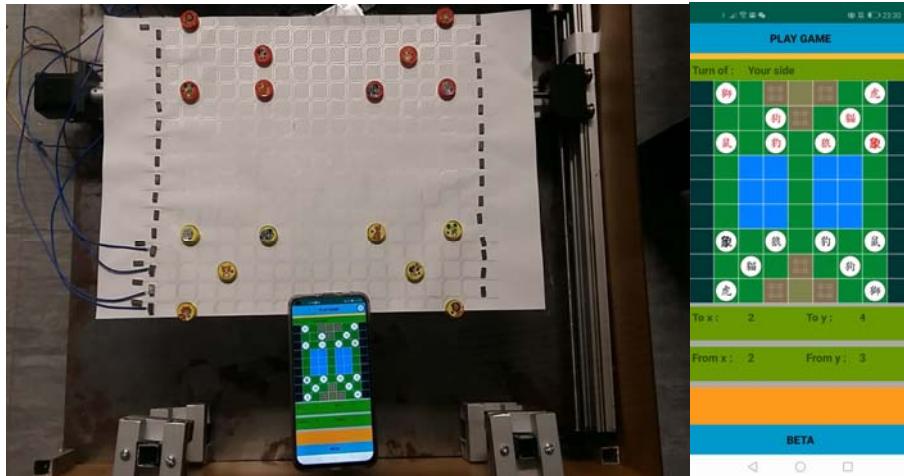
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	52
Project Title	Intelligent Board for Wizard Chess Game
Name of Student	Leung Ho Ming , Lee Chun On

Please attach ONE photo of your project here



Please list the functions of your project in point form

- The intelligent board is able to play animal chess game
- The intelligent board is able to generate a channel in a WIFI Hotspot for the APP player
- The intelligent board is able to control the real chess (magnet) automatically by the electromagnet on the motors' platform
- The intelligent board is able to control two motors in x-axis and y-axis
- The intelligent board is able to return the electromagnet (0,0) zero coordinate by limited switch
- The intelligent board is using AP mode to receive the data (chess movement) which comes from the APP
- The intelligent board is using TCP to transmit the data (chess movement) to the APP player
- The intelligent board is able to check the real chess movement
- LED screen is using as a backend monitor
- APP is using as a client interface for the players

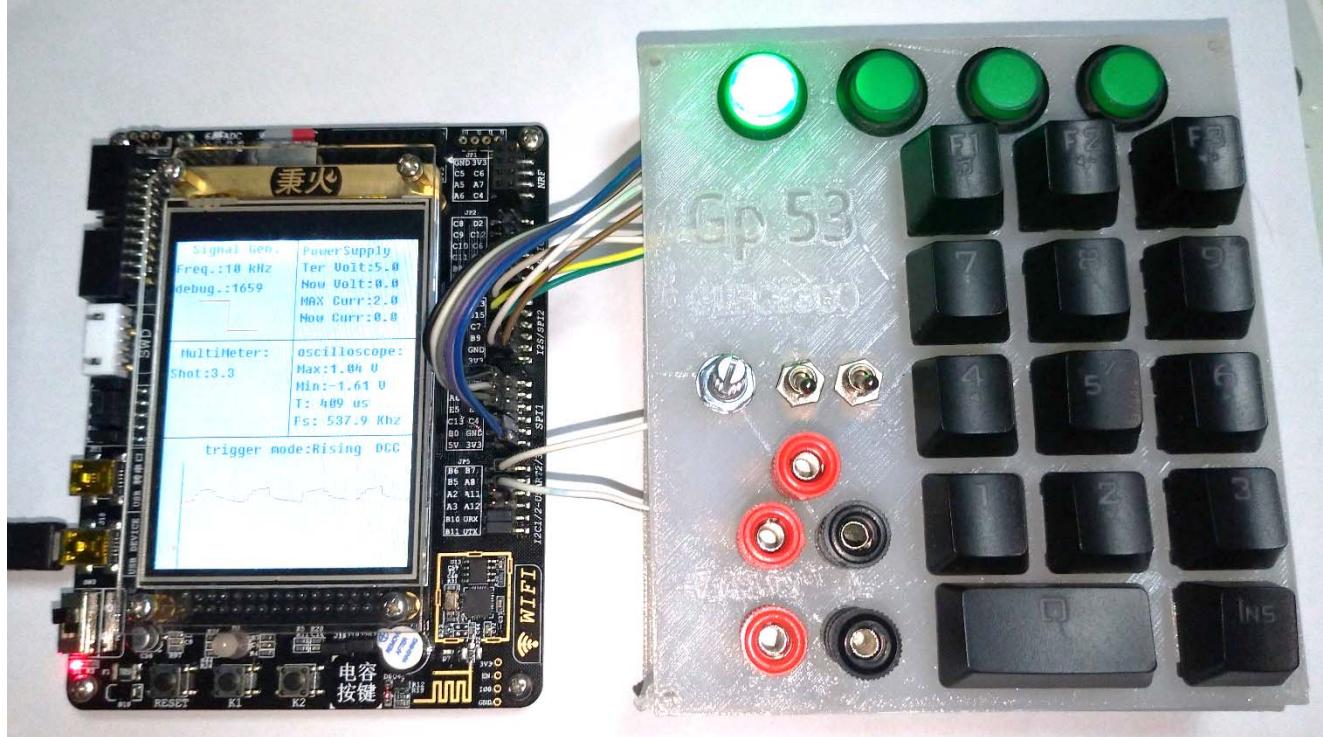
ELEC 3300 Project Summary Sheet

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Group Number	53 (Use other MCU)
Project Title	4 in 1 Test Bench instrument
Name of Student 1	Ng Wing Kong (20458540)
Name of Student 2	Chiu Ka Chun (20446951)

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Accurate PWM signal generation with wide frequency range (1Mhz to 20hz)
 - Accurate high duration
- Oscilloscope with maximum sampling frequency @1.1Mhz
 - MAX BW:~100khz
 - Wide input voltage range (+-10V)
 - Support both rising and falling edge trigger with adjustable trigger level
 - Adjustable Time axis
 - Adjustable zero level
 - wave magnification
 - Support both AC and DC coupling
- DC power supply
 - Voltage range 0-28v
 - Power limit 10w
 - Current limit
- Multimeter with three function
 - Voltage measurement
 - Range:0-10v
 - Current measurement
 - Range : 0-5A
 - Short-open detection
 - buzz when short
- User interface
 - LCD display for showing all the information
 - rotary encoder as adjust node
 - KeyPad for Precise number input
 - Button for function selection
 - light indicator to display which function is selected

ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	55
Project Title	Lock
Name of Student 1	BICALHO HAUER SANTOS, Bernardo
Name of Student 2	QUADER, Rubaiyat

Please attach ONE photo of your project here

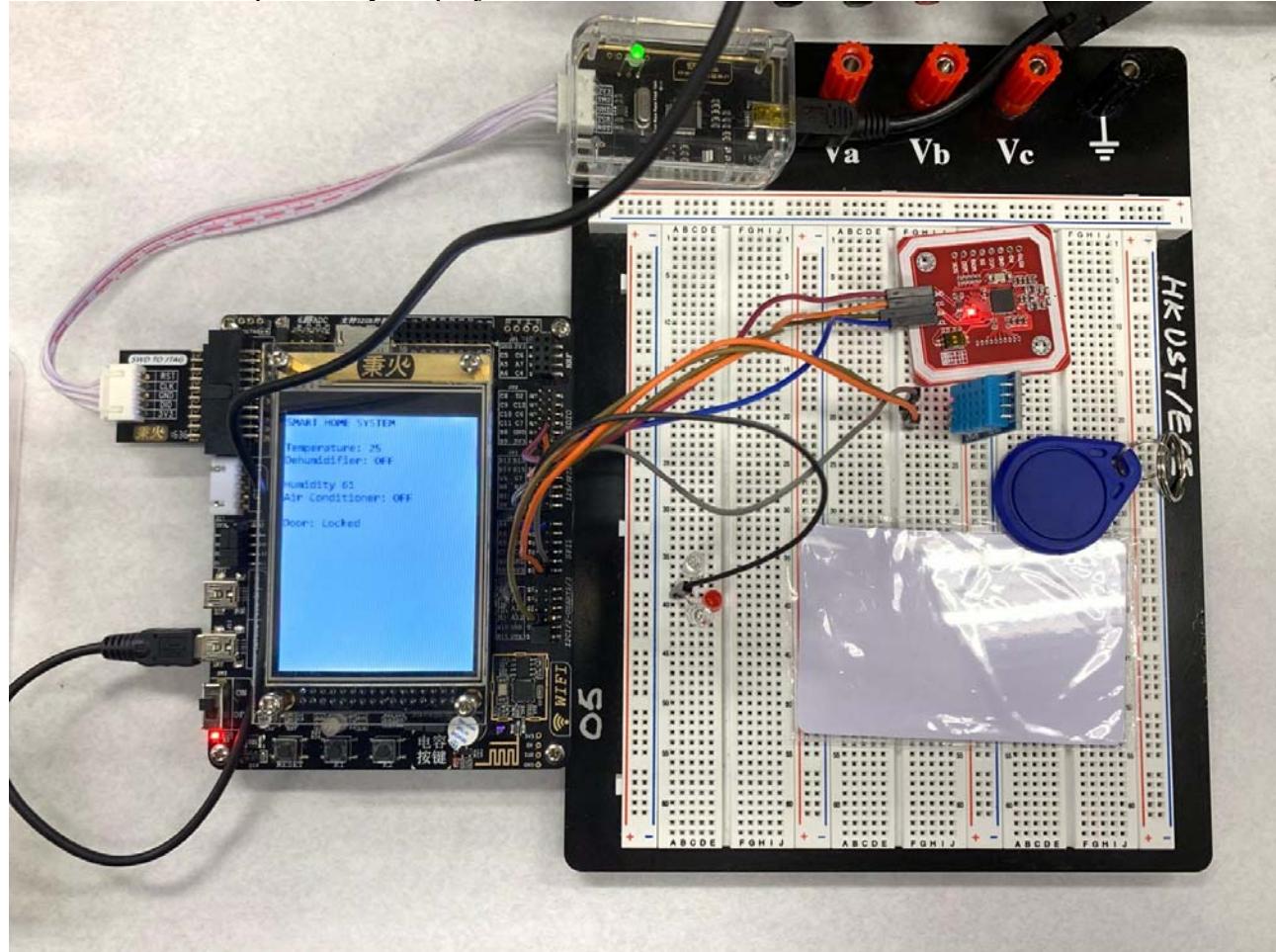
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	56
Project Title	Smart Home System
Name of Student 1	Tang Wai Nok William
Name of Student 2	Ho Long Ngai

Please attach ONE photo of your project here



Please list the functions of your project in point form

- Measure temperature and relative humidity by DHT11 module
- Turn on / off the LEDs (act as air-conditioner and dehumidifier) when the temperature and humidity achieve a specific level respectively.
- Display the temperature level, humidity level and LEDs status on LCD
- Use PN532 NFC module as a door lock system
- Display the door lock status on LCD
- Turn on/off the LED (acts as door lock) when the access card closes to the module

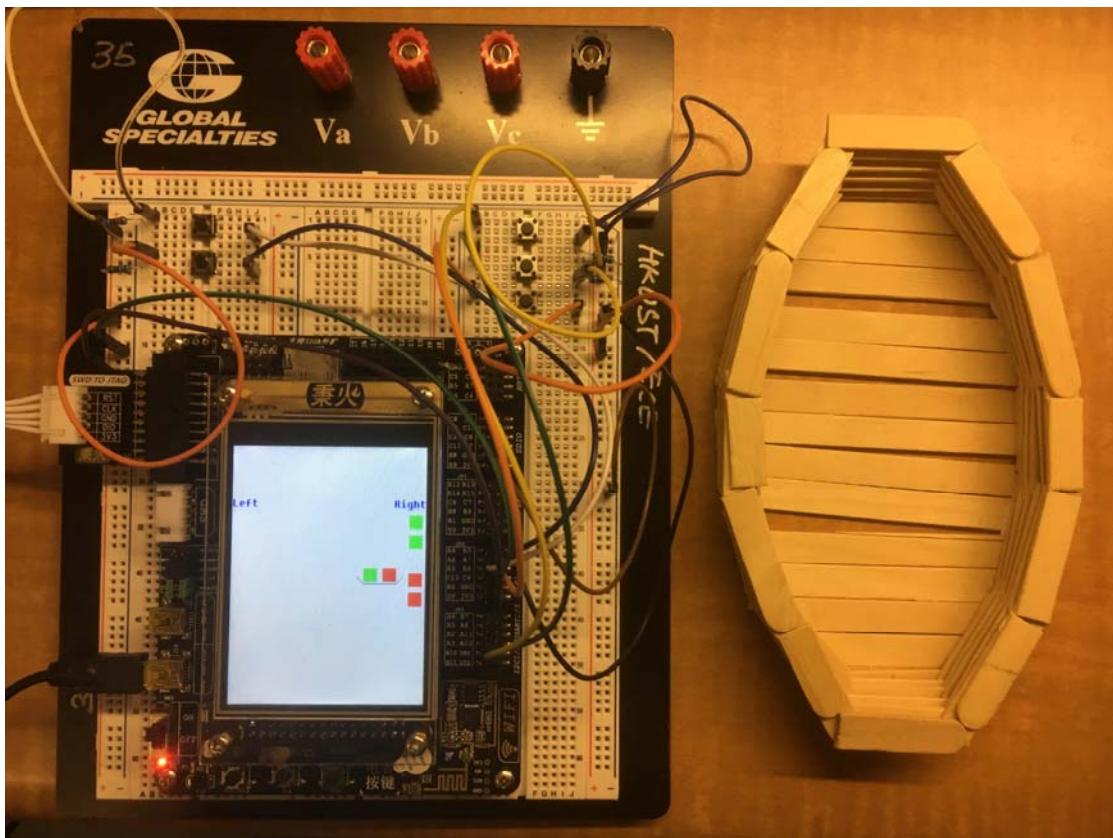
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	57
Project Title	The game of Cannibals and missionaries
Name of Student 1	Yip Lai Sau
Name of Student 2	Xu Jia Le

Please attach ONE photo of your project here



Please list the functions of your project in point form

- There are four buttons for selecting the characters on or off the boat with 2 red LEDs (represents cannibals) and 2 green LEDs (represents missionaries) and 1 button to control the sailing of the boat.
- Player can also use the infrared remote control.
- LCD will show how many characters on each side, countdown timer, and win or lose messages.
- Camera module above the LCD can capture the face of the player for saving and recovering the game record.
- Servo motor will flip the boat when it is sailing.
- Player uses the handle to maintain the balance of the boat, which is detected by the GY-521.
- Using RFID to show the tips if the player has no idea how to play.
- Speaker will play different sound effects if player win or lose the game.

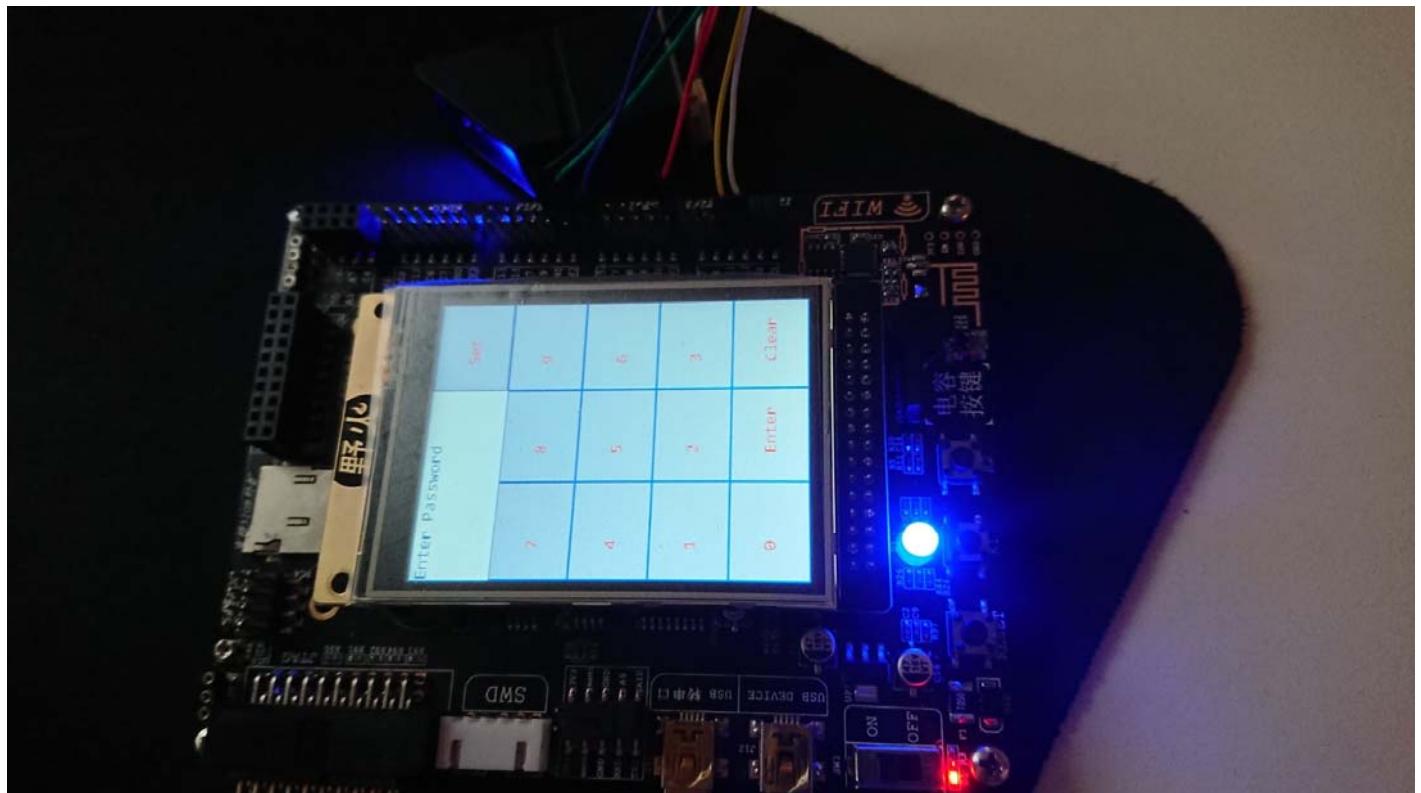
ELEC 3300 Project Summary Sheet

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All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	58
Project Title	Smart door lock
Name of Student 1	Cheung To Hung
Name of Student 2	Fung Chung Man

Please attach ONE photo of your project here



Please list the functions of your project in point form

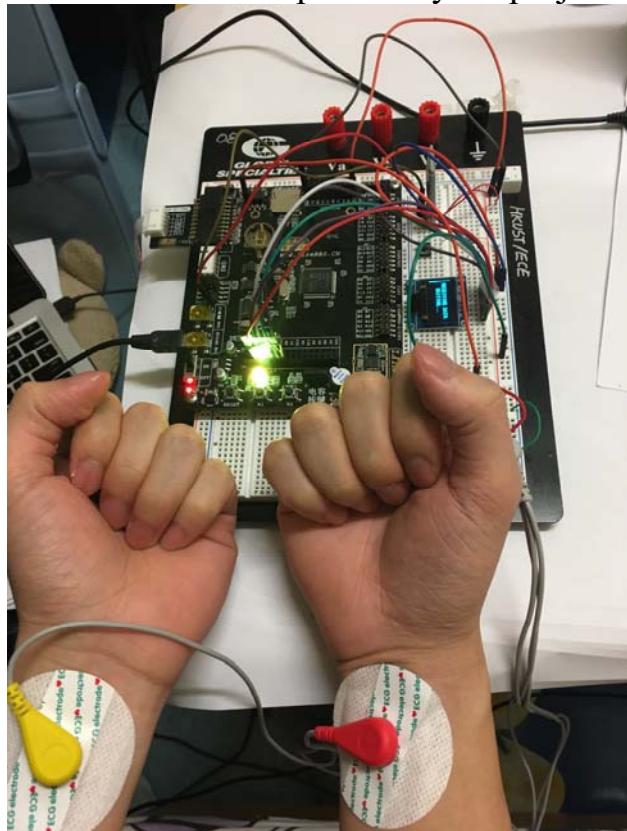
- Password check for unlocking door
- User can self-define their own password
- Buzzer will sound when door is unlocked for too long and automatically lock the door

ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.
All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	59
Project Title	ECG monitor
Name of Student 1	Lau Chun Yin
Name of Student 2	Ho Ka Chun

Please attach ONE photo of your project here



Please list the functions of your project in point form

1. Perform filtering on the ECG signal
2. Provide Local mode and Bluetooth mode for user
 - a. Local Mode:
 - i. Provide real time display of the filtered ECG signal on the OLED
 - b. Bluetooth Mode:
 - i. Send the ECG data to PC through Bluetooth
 - ii. Provide real time display of the filtered ECG signal on the remote device
 - iii. Enable data keeping in PC
3. Provide key and instructions on OLED for mode selection
4. Provide LEDs as indication of the selected mode

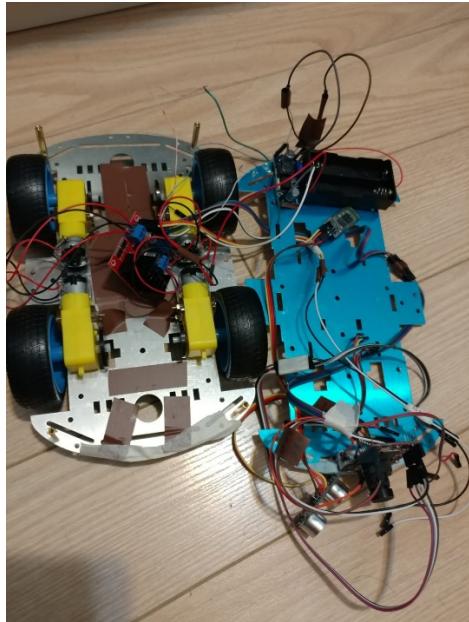
ELEC 3300 Project Summary Sheet

This is a ONE Page Summary Sheet, Content more than 1 page will be deleted.

All the fonts used in this Sheet should be in Times New Roman at 12 points

Group Number	61
Project Title	Remote Vacuum Cleaner
Name of Student 1	AU, Kyle
Name of Student 2	CHAN, Ka Hing

Please attach ONE photo of your project here



Please list the functions of your project in point form

Main components	Protocol used	Function
Motors	GPIO, PWM	Positioner
Bluetooth	USART, USART interrupt	Connect & communicate with Android devices
LCD	FSMC	Display information and settings
Motor (vacuum cleaner)	GPIO, PWM	Clean the dust
On/Off switch	PWM	Simply switching the robot