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Mona - an Affordable Open-Source Robotic Platform for Research and Education

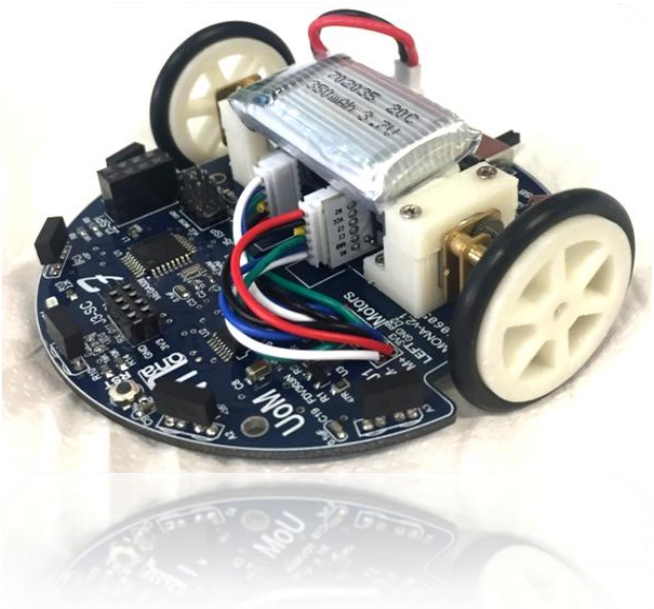
Mona has been developed for study on Perpetual Robot Swarm. The first version of Mona was used as an educational robotic platform for undergraduate robotic lab. Mona is a modular robot so we can develop various modules (e.g. vision, RF communication, WiFi, Sonar, manipulator, etc) which communicate with the main processor via I²C, SPI, and RS232.

Mona supports Arduino architecture. It comes with an Arduino Bootloader, hence all you need to do is to download the Arduino IDE (an open-source programming platform), install driver for USB, choose "Arduino Pro or Pro Mini", and upload your Sketch (code) to the robot.

Please download and install the latest version (ARDUINO 1.8) IDE:
https://www.arduino.cc/en/Main/Software

Robot's specification:

- Speed: 20 cm/s
- Five short-range IR proximity sensors (<2cm)
- Wheels' encoder (250 ppr), wheels' diameter 30 mm
- Micro USB for programming and recharging battery
- 3.7 V Li-Po battery
- Communication: RS232, I²C, SPI links



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http://www.monarobot.uk
http://www.uomrobotics.com
http://www.colias.uk

Programming using ARDUINO

- Provided functions:

```
void motors(int left, int left_dir, int right, int right_dir);
void turn(int turning_direction, int turning_speed, int turning_delay);
void IR_proximity_read(int IR_enable_inp);
int check_obstacle(int IR_enable_inp);
void motors_stop();
int obstacle_avoidance(int IR_enable_inp);
void readLight();
void LED_top(int LED_enable_inp);
void LED_bottom(int LED_enable_inp);
void LED_module(int LED_enable_inp);
void printIR(int IR_enable_inp);
void printLight();
```

Table I: Mona Pin Configuration:

ARDUINO PINS	Function	Input / Output Values
10	Left Motor PWM	0-255
9	Right Motor PWM	0-255
5	Left Motor DIR	0=FW or 1=BW
6	Right Motor DIR	0=FW or 1=BW
2	Motor Left Encoder	INT0 , 0 or 1
3	Motor Right Encoder	INT1 , 0 or 1
13	LED 1 (Top)	0=OFF or 1=ON
12	LED 2 (Bottom)	0=OFF or 1=ON
11	LED Light Module	0=OFF or 1=ON
4	IR Enable	Output: 0=OFF or 1=ON
A7	Received IR Right	0 (white obstacle) or 1023 (no obstacle)
A0	Received IR Front-Right	0 (white obstacle) or 1023 (no obstacle)
A1	Received IR Front	0 (white obstacle) or 1023 (no obstacle)
A2	Received IR Front-Left	0 (white obstacle) or 1023 (no obstacle)
A3	Received IR Left	0 (white obstacle) or 1023 (no obstacle)
A5	Light Left (Ext Light Module)	0 (Dark) or 1023 (Bright)
A4	Light Right (Ext Light Module)	0 (Dark) or 1023 (Bright)

For more detail, please visit: https://github.com/MonaRobot

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