Development and build of a rover car With Internet and GPS connection

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Project info

The aim of this project was to develop a **rover** connected to the internet (**Internet of things**) through a mobile internet connection. The entire project (code, hardware design, etc.) is to be made available as an open source project for others to learn from.

Using the internet and a **remote server,** commands are sent to the rover from any device from anywhere in the world. The commands that can be sent includes **orders to move the vehicle** in different directions (i.e. to have full control) and also an order to activate an **autonomous** mode, which moves the vehicle while avoiding obstacles.
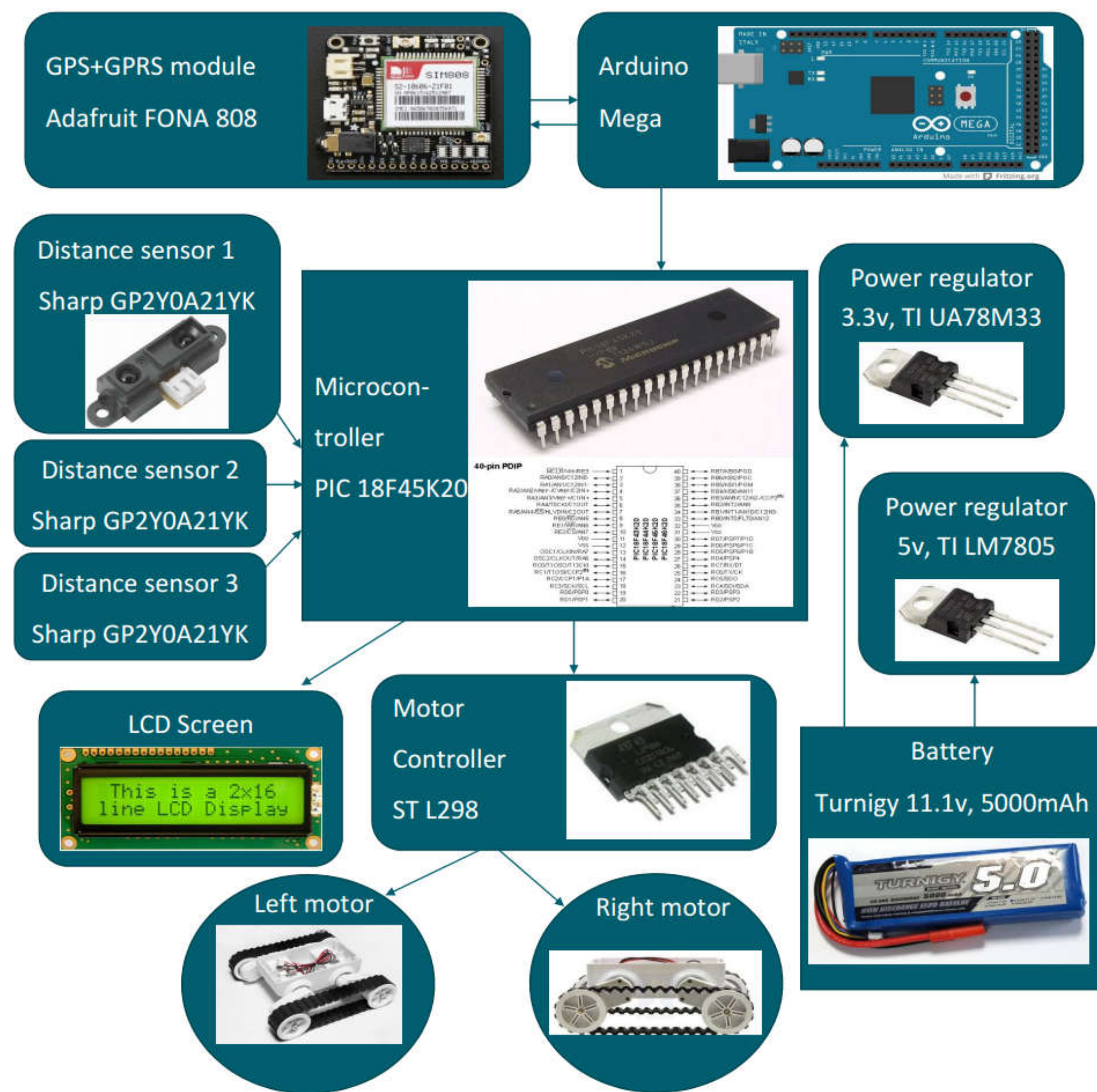
In order to avoid the obstacles, the rover has three **distance sensors** which informs the microcontroller of the distance to the objects, and an algorithm in the rover changes the direction to avoid obstacles.

The system is checking continuously if there is an available **GPS** signal, and if it finds a signal, sends the coordinates (each minute) to a remote server, and from a webpage we can see this coordinates **drawn in a map**.

Method

In the **diagram** below, one can observe the different components and the connections. Note that the power wires have not been drawn to keep the diagram easy to read.

The **PIC** receives instructions from the **Arduino**, which receives data from the **GPRS and GPS module**. The PIC also receives data from the **distance sensors** and sends orders to the **motor controller** and to the **LCD module**.

- GPS+GPRS module Adafruit FONA 808
- Arduino Mega
- Distance sensor 1 Sharp GP2Y0A21YK
- Distance sensor 2 Sharp GP2Y0A21YK
- Distance sensor 3 Sharp GP2Y0A21YK
- Microcontroller PIC 18F45K20
- Power regulator 3.3v, TI UA78M33
- Power regulator 5v, TI LM7805
- LCD Screen
- Motor Controller ST L298
- Battery Turnigy 11.1v, 5000mAh
- Left motor
- Right motor

Conclusions

During the execution of this project, many areas studied as part of my degree in **electronic engineering** have been utilized, including mounting **analog** and **digital** electronic components and developing all the program for the **PIC** microcontroller and for the **Arduino**. This project has also covered areas outside the scope of my degree, for example **informatics** and **automation** and **mechatronics** engineering.

Skills Gained

- Design and development of circuits
- Development of software for the PIC
- Development Software for the Arduino
- Understanding & Programming the interactions between the server & Arduino
- Understanding & Programming the interaction between the Arduino & the PIC
- Develop User Interface for the webpage
- Build the components in the chassis
- Manual and autonomous modes
- Tracking by GPS in map

Extra information

You can watch a video, download the **code**, the full report, and all the documentation related with this project in the **GitHub** repository:

www.github.com/jorgecrce/IOT-Rover

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