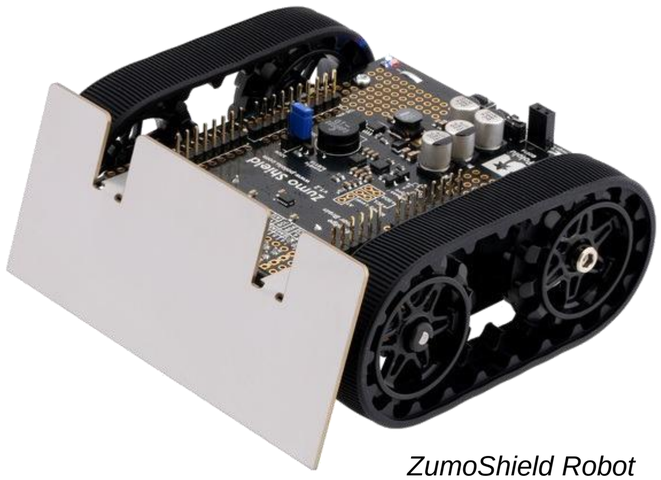
Department of Informatics
BSc (Hons) Computer Science
Academic year 2019/20

Robot Control Interface: From Arduino to ARM Mbed

Priyata Kaneria



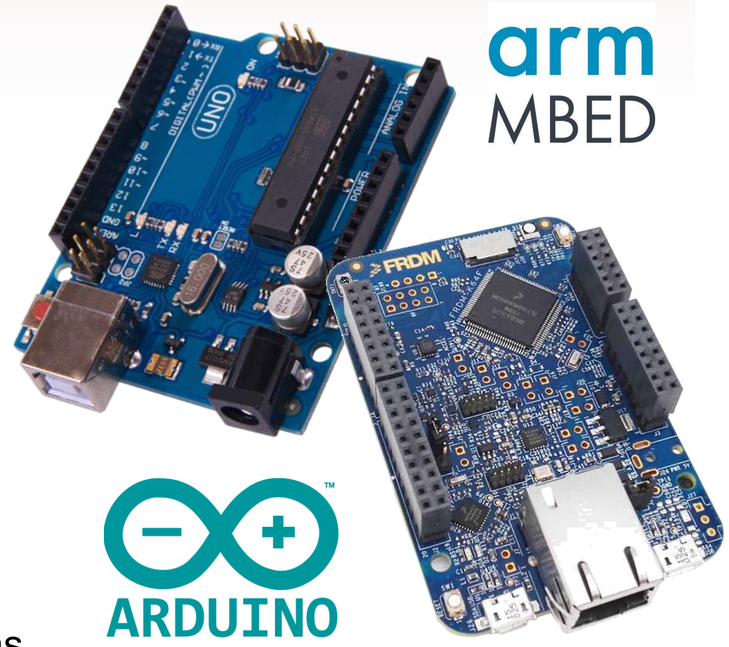
ZumoShield Robot

Arduino is a simplistic, prevalent platform in its use amongst hobbyists, but not so much amongst professional engineers. Their boards have numerous limitations which can be tackled by using alternate, Arduino-compatible controllers such as Mbed.

Mbed boards can be more powerful due to their:

- practical size
- increased RAM
- increased Flash Memory
- increased Clock Speed
- IoT functionality

using Bluetooth, sdCard and WiFi



The ZUMO robot's C++ library codes, written for the Arduino platform, will be translated to run on the ARM Mbed FRDM-K64F microcontroller board. It can then be used to control the robot's:

- *LEDS*
- *Pushbuttons*
- *Motor Drivers*
- *Buzzer*
- *Infrared Reflectance Sensor*
- *Accelerometer*
- *Magnetometer*
- *3-axis Gyroscope*

This project will assess the differences in the Zumo robot's performance and functionality on both the platforms, exploring the process and evaluating the challenges faced when retiring and replacing out-dated hardware; "software porting" valuable solutions.

Project Tasks:

1. Code translation using Arduino IDE & Mbed Studio
2. Software Porting Investigation
3. Microcontroller board performance comparison

Mbed has more potential for growth in the long-term in this increasingly IoT-based age, and supports a wider range of potential applications.