

Andre Ani, Andrew Willson, Jes Martin Poblete,
Kevin Sounthavong, Parth Patel
Advisor: Dr. Laleh Najafizadeh

Introduction

- Since Edwin Budding invented the world's first lawnmower in Gloucestershire, England in 1827, keeping one's lawn trimmed and tidy is a laboring task for most people and often time consuming.
- This is especially true in the summertime when the weather is very hot or when one has a physical condition, such as lumbar pain or seasonal allergies, that leaves him/her unable to mow the lawn.
- A lawn mower with a mounted camera that is controllable via an Android device might be the answer to mowing lawns on those hot summer days.

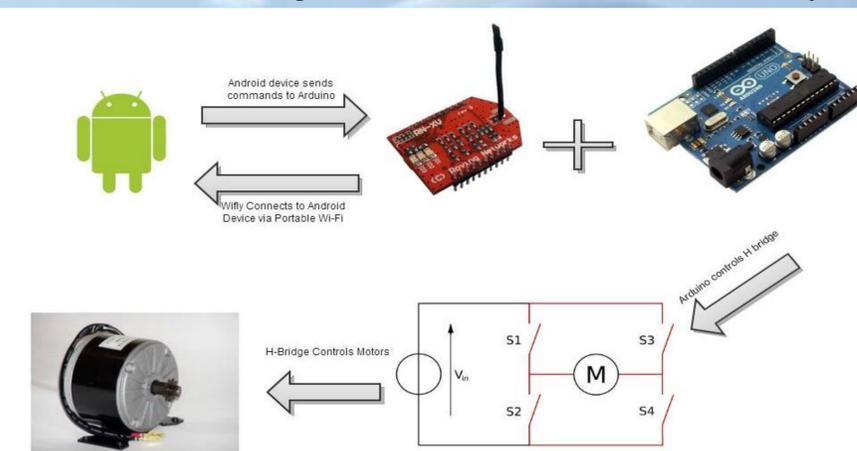


Figure 1: Block diagram of the Android controlled lawn mower

Software

- Failsafe implemented through polling.
- Background threading sends commands every 5ms.
- Auto-reconnects when tablet isn't detected or failsafe has gone off repeatedly.

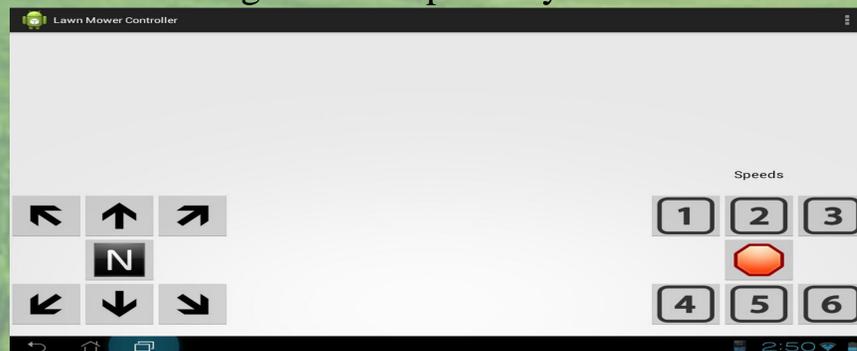


Figure 2: GUI- Six Speeds, Six Directions

Hardware

- Two H-Bridge controller circuits provide directional control.
- Each circuit has two Arduino inputs that allow for controlling the direction and the speed.
- Speed control is done through Pulse Width Modulation.

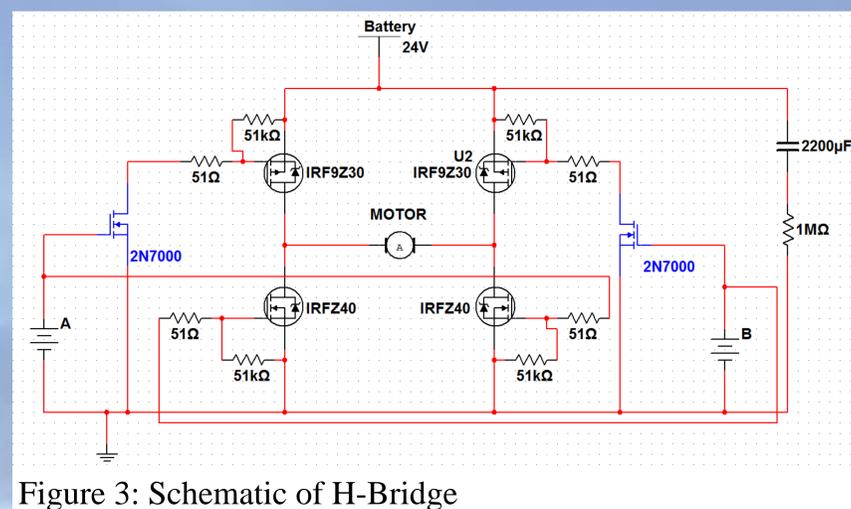


Figure 3: Schematic of H-Bridge

Overall Design

1. The WiFly module is connected to the Arduino.
2. The WiFly module connects to the Android device through an Ad-Hoc network.
3. The user presses the buttons on the Android device and the device sends signals to the WiFly Module.
4. The Arduino interprets these signals and determines which speed and direction should be used.
5. These interpreted signals go through to the motor controller as either high or low inputs.
6. Depending on the signal, the motor controller will tell the vehicle to move forward, reverse, turn left or right, at the user's desired speed.
7. The vehicle moves through Differential Steering.

Differential Steering

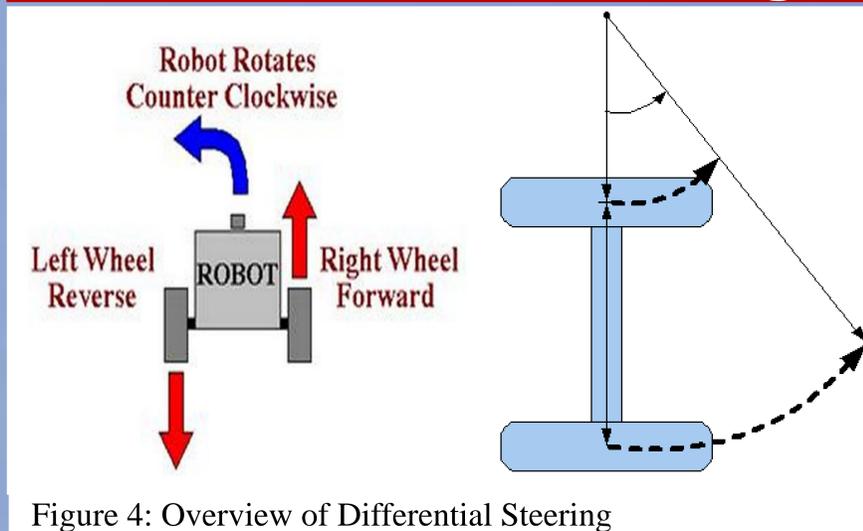


Figure 4: Overview of Differential Steering

Future Works & Improvements

- Etching board
- iOS app, Integrating video with app
- Metal frame
- Lower frequency for better range
- Leaf/Grass collector
- Wheelbarrow, Snowplow, Flame Thrower, Edge Trimmer add-on



Figure 5: Final Product