Self-balancing Car Folder Contents

This file describes the various files found in the Self-balancing Car folder on fweb.

- esp_wroom_32_datasheet_en.pdf: This is the datasheet for the ESP32 WROOM modules.
- Keystudio Balance Car Shield V3 Schematic.pdf: This has the schematic of the daughterboard for the Keystudio Self Balancing Car.
- KS0143 Bluetooth Xbee Wireless Module HC-05.pdf: On the above daughterboard there is an XBEE bluetooth module made by Keyestudio. This is the documentation for that board.
- KS0377 Keystudio Balance Car Shield V3 (Black and Eco-friendly).pdf: This is the docs for the daughterboard. (It does not contain the schematic. See above for that.)
- sch-Wemos-D`-R32.pdf: This is the schematic for the ESP32 replacement board used on the cars.
- TB6612FNG.pdf: Datasheet for the motor controller used with the cars.
- Two Wheeled Self Balancing Car Good Paper.pdf: A good paper to read. It does a lot of your work for you.
- Wemos D1 R32 Folder: This contains some arduino code that I wrote to help you if you are not able to use the 6302view to control your car. For example, if 6302view is not fast enough. I don't know if it will be, but this code also shows you how to read the sensors and control the motors, and how to setup a timer. The 6302view has the advantage that you can display quantities you care about, and you can input quantities you want to change. It also sets up the timer for you so you don't have to, but it does more than you need to just control the car, and it may take too much time do do the data transfer to your laptop.
    - Timer_ESP32: This shows you how to setup a timer and have a timer interrupt, and blink the LED at that rate.
    - Encoder: This shows you how to read the encoder (to tell the wheel angle) and incorporates the timer.
    - WemosD1KeyCarMotorDrive: This shows you how to do PWM with the car to make the motors turn.
    - WemosD1KeyCarMotorDriveEncoders: This does the same as the above and incorporates the encoders to read the position as the motor drives the wheels.
    - WemosD1KeyCarMotorDriveEncodersAccel: This does the same as the above and also incorporates the accelerometer reading. It does the basic math to get the angles, but does not use a complimentary filter or Kalman filter or controller or any other type of observer.
    - Kalman_Test: This is a test program I made to see how well the Kalman filter works with the Wemos D1 R32 and the car.
- Wemos D1 R32 and Keystudio Self-Balancing car Conversion.pdf: Instructions on replacing the Arduino Uno board with the Wemos D1 R32.
- Wemos D1 R32 w_ESP32 Uno R3 pinout.pdf: The pinout for this board. It is also in the conversion document above.