

December 2009 RSSC Meeting

John Walters: [class: Using and Controlling DC motors](#)

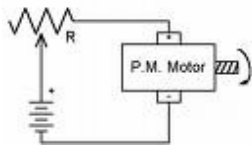
DC Motor

- Simple Controller
- H-Bridge Amplifier
- Quadrature encoder
- Control Theory (P10)
- HCTL controller
- uCont 16F877A
- PC notebook

Anatomy of a motor: Here is a link to the site that john showed.

<http://www.gearseds.com/curriculum/images/figures/Motor.swf>

Simplest motor control is a Pot in series with the motor to control the voltage to the motor. A Double Pole, Double Throw Switch controls the direction of the motor.



Here is a link to my take on a basic hbridge using a relay and a darlington transistor:

<http://profmason.com/?p=381>

Hbridge looks like an H.

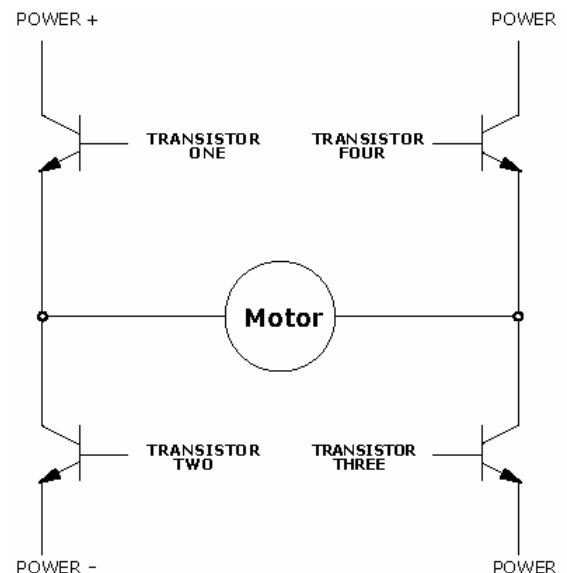
http://www.societyofrobots.com/schematics_h-bridgedes.shtml

Here is a link to a design that I have used:

<http://www.8051projects.net/dc-motor-interfacing/bjt-based-h-bridge.php>

It relies on TIP31 and TIP32 transistors. These are not terribly efficient nor can they handle a significant amount of current. The one saving grace of this design is that I have actually made it work!

More commonly folks use Mosfets for their designs. I have had very limited success with the Positive side of Hbridge based mosfets. (Except as toasters)



There are Hbridges in a chip such as the one described here:

<http://profmason.com/?p=243>

This is a superior way to go long as currents are moderate (<2 Amps)

PID Control Chip: Uses feedback from encoder to set speed of motors

HCTL 1100 is a PID Chip

A more modern equivalent is a LM629

You can roll your own PID Chip using a PIC etc.

<http://www.shawnlankton.com/2005/03/pic-pid-controller/>

Or Using an Arduino:

<http://www.arduino.cc/playground/Code/PIDLibrary>

Quadrature Encoders:

Feed the encoder into a Dflip flop to get logic level for CW/CCW. Then you don't have to distinguish the phase difference of the two signals from the encoder, just count the pulses.

There is a description of how to do this here:

http://books.google.com/books?id=Y6ctARXqLYC&pg=PA53&lpg=PA53&dq=D+flip+flop+encoder&source=web&ots=B1JLCt7MLH&sig=X5ovnTyks4Y_J_0LTfnq-kdiNo&hl=en&sa=X&oi=book_result&resnum=4&ct=result#PPA52.M1

Business Meeting:

New Officers elected for 2009:

Martin Mason: President

Bruce Weimer: Vice President

Tomas Webmaster / Secretary

Ron Rose: Treasurer

Robotics competition: Robot Sumo in February: Compete against students from Mt. SAC.

Award of plaque to Don Fears: Don has given years of service to the club helping to make sure that the room is available, buying donuts at every meeting and otherwise making the club possible. There was universal acclimation of Don's good work.



Buy a cable for projector: Ron Rose

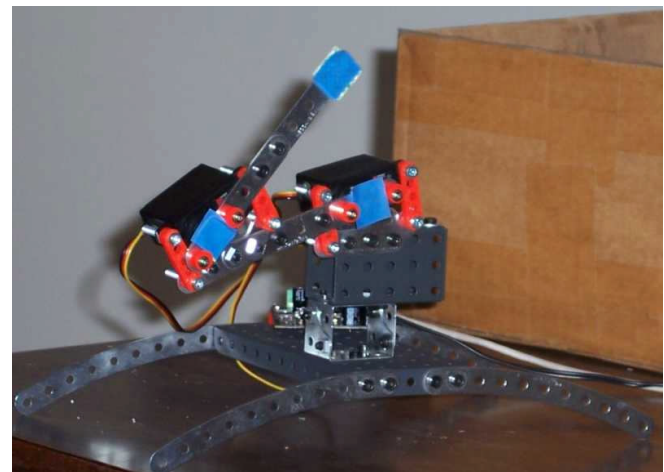
Changed dues to \$10

Show and Tell:

Ken Active Sensors – Local Planning in Mobile Robotics

Penelope Smith

Emil V: Robotic arm: Single camera tracks arm motion and uses an iterative approach to determining optimal path. Emil has a website



where he details the progress on this project at:

<http://www.robidouille.com/>

Thomas demonstrated his android arm. The primary problem is getting a sufficiently torquy servo to lift the shoulder joint. He fabricated some elbow brackets that lift the forearm and is experimenting with servo gearboxes.

Marty showed his blackfin camera(I believe this was the model) attached to a pan and tilt base. He is having some trouble reading the serial stream out of the camera.

