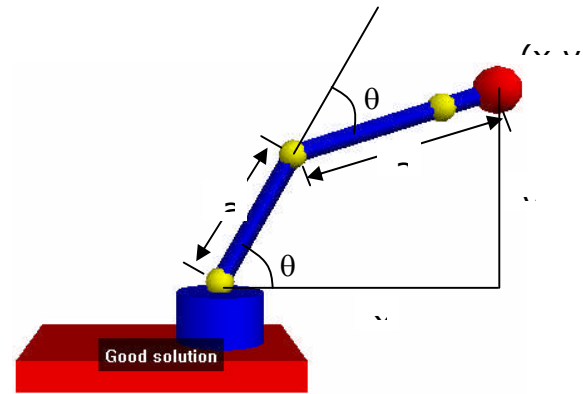


RSSC Meeting: May 10, 2008

Class: Martin S. Mason
Forward and Inverse Kinematics

A servo controller was built using an ATMEGA168. It takes serial input and outputs servo signals. It also has an interface to a Wii Nunchuck for manual control.



Forward Kinematics is: Given the angles θ_1 and θ_2 , find the X and Y coordinates of the end effector of a robotic arm with segment lengths a_1 and a_2 as shown.

Inverse kinematics is given the coordinated (x,y,z) calculate the necessary angles ϕ, θ_1 and θ_2 .

Business Meeting:

325.25 in the treasury. Pick up your room contest is scheduled for July. Robomagellan is scheduled from November.

Class in June on Rapid Prototyping. Print from computer to paper and then fiberglass the paper.

Class in July on PIC microprocessors.

Requested Classes:

How to setup a website.

Analog amplifiers practical design. Amplify small signals for use with A/D inputs.

Communicating with a robot from the PC. Troubleshooting RS232

How to use RC motors and adapt them to continuous rotation.

Show and Tell:

Jim showed his entry for Pick up the kids. It successfully picked up several coke cans. He needs to add a navigational system.

John Davis brought his entry to the Robomagellan competition. Problems with using GPS are that there are large errors and that microprocessors don't handle floating point or trig. GPS is not sufficient BUT necessary.

uMFPU V3.1 coprocessor chip about \$20!

<http://www.micromegacorp.com/umfpu-v3.html>

Available from Sparkfun and others.

Martin Mason: Cheap Color Sensor: RGB LED with each channel hooked up to A/D input of microprocessor.

Steven visited Makers' Faire. Carl built something new for www.teletoyland.com Marble goes through a maze made from legos. The system was originally designed for users to drive the table from external controls over the internet. Steven uses a [Philips SPC 900NC](#) camera that does 90 fps and has good low light sensitivity, it also has a nice square field. A camera looks downward at the playfield. Simplify the field into 16x16 map. Solve the maze and display the solution. Map the solution. Start the solution. The solution is recalculated each time and the marble is moved.

Microsoft has entered into the robotics arena. Robotics Studio. There are a series of contests using Microsofts simulated environments. The competition is called <http://www.robochamps.com/>

John Walters demonstrated his Electromechanical player piano. He uses solenoids to control each of the channels of the piano. He demonstrated a bank of 8 solenoids which would control 8 of the 88 notes on the player piano. He uses an 8031 microprocessors. 4 80255s to multiplex 96 channels.