Assistive Robotic Arm

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Arm Concept

- Support Wheels
- Linear Actuator
- Brackets
- Shoulder Servo
- Bracket
- Elbow Servo
- Big Gripper
Control Mechanism

- Movement of servo motors is simultaneous with movement of a single joystick.

- Cartesian Coordinates inputted into program and angles of the servo motors are outputted.

- Measurements were made so that there was a direct relationship between pulse width and servo angle.
LabVIEW – Front Panel
$Z_{sq} = x^2 + y^2$;
alpha = acos((Z_{sq} - A^2 - B^2)/(2*A*B));
small = acos((B^2 - Z_{sq} - A^2)/(2*A*sqrt(Z_{sq})));
big = atan(y/x);
beta = big - small;
Convert Angle to PW

- Servo Horn has holes 180 degrees apart.

- PWM program to see what PW would lead to 180 degree rotation.

- Then 90 and 45 degrees were completed and a linear fit model was used.
Conversion

\[ 0.000517 \times 90 \div \] 

\[ 0.000909 \]

\[ \text{Pulse width} \]
Big Picture

- Joystick
- LabVIEW
- Angle to PW
- Servo Motors
Future Work

- Order Microprocessor
- Contact Client
- Work will begin on mounting brackets for linear actuator and shoulder servo.
Questions?