# 2016 Software

# Strategy

- Get max points in autonomous
- Shooting in the high goal
- Driving through simple defenses
- Scaling the wall

# Requirements List

1. Drive the robot
2. Shoot the ball
3. Scale
4. Retrieve the ball

# Robot components that software must control

1. Drivetrain
2. Wheels pull in ball and then push it back out
3. Rising and lowering of the arm
4. Piston pushes ball into the wheels
5. Telescoping arm
6. Winch
7. ?something for pushing the hook?

# Functions for Controller

- Pull in ball (hold)
- Toggle shooter
- Auto aim
- Raising/Lowering arm
- Pushing/Pulling arm
- Piston to push ball
- Winch (multiple buttons?)
- Analog/Joystick driving

# Robot Sensors

1. Camera?
    1. To see/vision on autonomous mode (track the defenses/batter)
    2. Track (distance/azimuth/elevation) to the high goal
    3. Track other robots?
2. NavX 9 axis navigation system
    1. Auto align through the defenses
    2. Get robot to a location in autonomous mode
3. Selector
    1. Five different positions (autonomous)
4. Encoders
    1. For drive
    2. Winch
5. Limit switches?

# Autonomous Functions

- Option 1: Touch outer works (2 points)
- Option 2: Just crossing defense (12 points)
- Option 3: Damage a defense (22 points)
- Option 4: Cross defense and shoot (22 points)
  - 5 different starting positions
  - Drive forward (to and across defense)
  - Initiate pre-shooting sequence (revving wheels, raising and extending arm)
  - Find where to rotate to (dependent on starting position)
  - Drive again (to batter)
  - Rotate again (align with goal)
  - Auto aim and shoot
- Option 5: Damage defense and shoot (32 points)

# Auto Aim

1. Identify target (reflective tape, shape)
2. Align with target
3. Determine distance
4. Adjust shooting arm based on distance
5. (Autonomous) Shoot the ball