REBEL ROBOTICS

TEAM 2638: Great Neck South High School

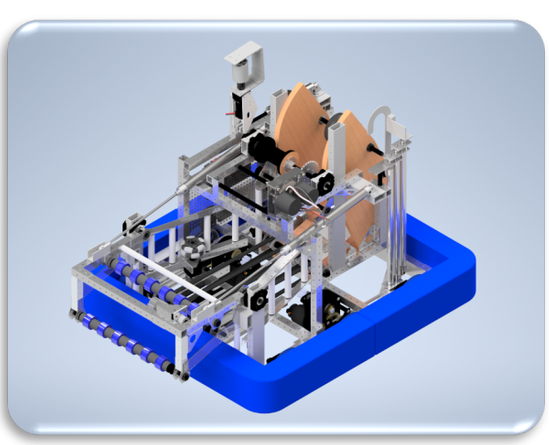
West Coast Drivetrain
- (6) 6” traction wheels
- VEXpro 2-CIM Ball Shifter powered by 2 Falcon 500 motors
- High Speed: 14.76 ft/s
- Low Speed: 6.49 ft/s
- Driven by #25 chain

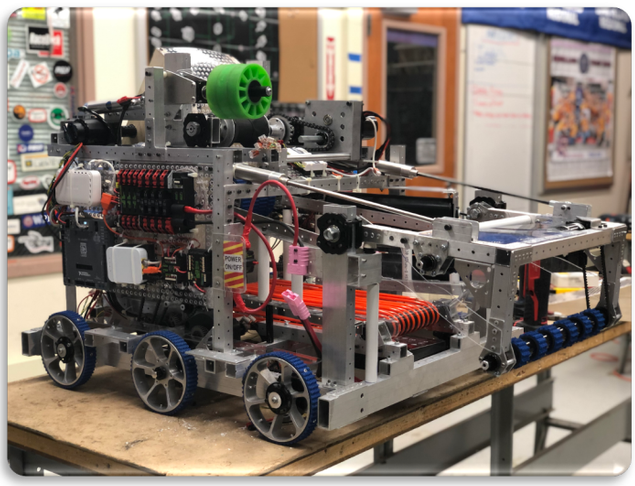
Hopper
- Storage
    - Holds up to 5 power cells at a time
- 4 belts wrapped around pulleys
    - 1050 5m timing belts
    - 36 tooth pulley on front
    - 24 tooth pulley on rear
- Motor – 775 pro 60:1 Versaplanetary gearbox
- (4) 4” stealth wheel with ½ in hex bore 50A Durometer
- Agitator wheel: 3.25 omni-directional wheel powered by 775pro 90:1 Versaplanetary gearbox

Shooter
- (2) Falcon 500 Motors 1:1
- Hood backing composed of polycarbonate
- (2) Side platings made of poplar wood
- (2) 4” Colson wheels
- (2) 3.25” Accelerator Wheels

Climber
- (3) 16” pistons
    - Linked with custom plates
- CNC – ¼ hooks grasp onto the bar, releasing when the pistons retract
- Winch winds up rope and lifts robots
- Uses 2 NEO motor and a ratcheting Toughbox gearbox 12.75:1

Power Cell Intake
- BAG Motor 10:1 Versaplanetary gearbox
- (2) 19” rollers w/ 1.5 in blue Nitrile Roughtop Tread wrapped
- Pivots on (2) 12” pistons





Control Panel Spinner
- BAG Motor 10:1 Versaplanetary gearbox
- Pivots on 4” piston
- Color sensors (see *Sensors and Feedback Devices* section)
- (4) 2” straight flex wheels ½ in hex bore 30A Durometer

General Software Information
- Programming language: Java
- Neural Network language: Python
- Multiple commands that use sensor and time feedback to automate processes
- Multiple command groups to automate multiple processes in succession.

Sensors and Feedback Devices
- Neural Network: using machine learning on dedicated Raspberry Pi for power cell detection
- 2 Limelight cameras: used for automating turning and accelerating to targets
- Processors: each camera has a dedicated Raspberry Pi
- Encoders: on all drive train motors to detect position/speed
- Light Sensor: for control panel completion
- PID Control: on drivetrain and on shooter for consistency and accuracy
- Cubic Regression Analysis: used to adjust for joystick sensitivity
- navX-Micro: used for odometry on the robot for autonomous driving

Automated Processes
- Vision targeting using Limelight camera (PID control to line up with target)
- Drive straight using arcade drive toggle (robot default is tank drive)
- Control panel stops when proper configuration reached