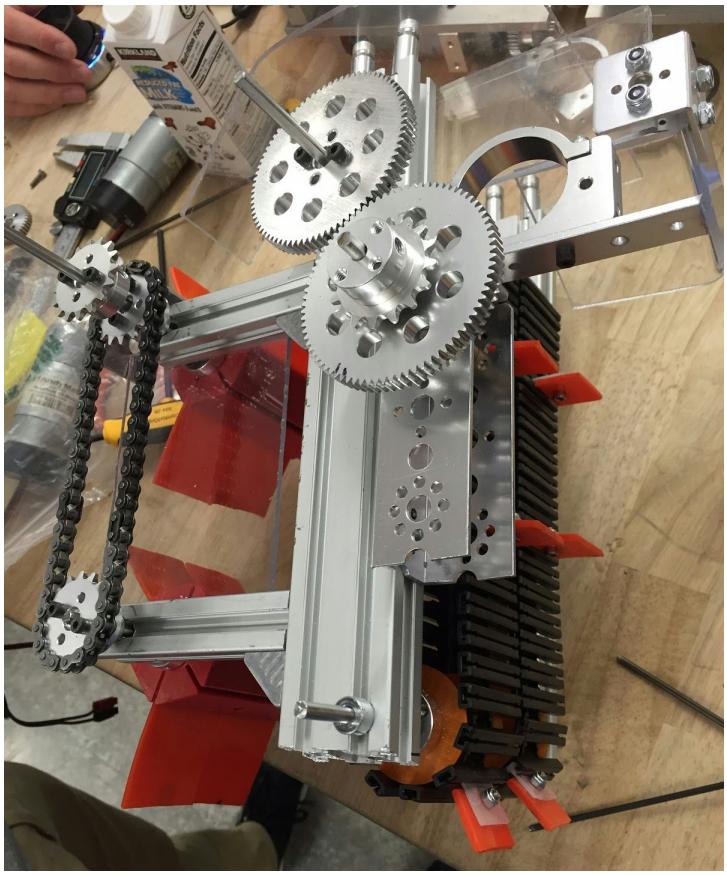
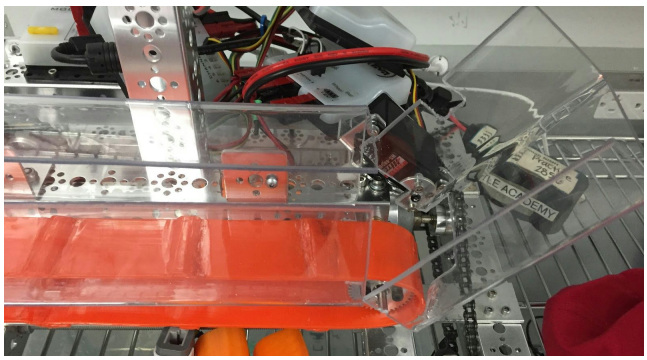
Scoring Mechanism:

The scoring system went through three main iterations, all using the same concept for scoring. The concept involved picking up blocks and scoring them with a conveyor belt that could dispense out of either side of the robot.



The first iteration combined the conveyor and collector into one mechanism. The conveyor portion used two timing belts side by side which rotated around the platform of the collector. **The collector used four polyurethane paddles mounted on an axle parallel to the ground.** This method proved too wide for our chassis design and was inefficient, so we moved on to our next iteration.

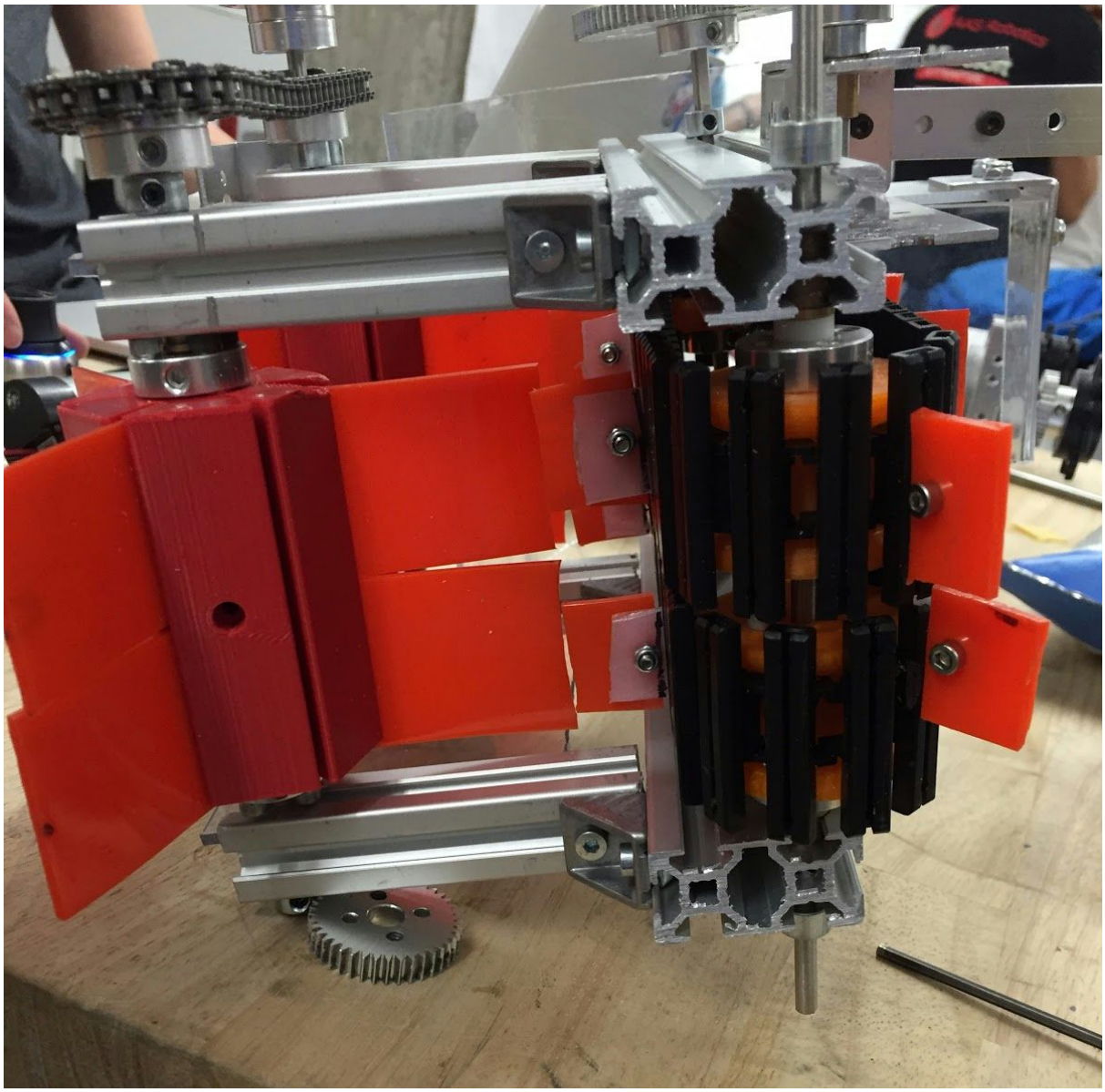
The second design separated the conveyor and the collector into two mechanisms, but used the same method of picking up blocks as the first design. The timing belts were too long for the second design so we used polyurethane belting instead. Polyurethane has a very high friction coefficient and it can be melted into a continuous belt that functions similarly to a timing belt. However, there were still issues fitting the horizontal design of the collector onto the robot. There was also the question of how to transfer blocks from the collector to the conveyor. Both of these problems proved too time consuming and the second design was scrapped.



The final and current design involves a **vertical collector mechanism** and a slightly improved version of the second conveyor system. The collector **picks up blocks and propels them upward with spinning paddles**. The blocks then fall into the dispenser mechanism. This distributes blocks out the **right and left, depending on what side the buckets are.**

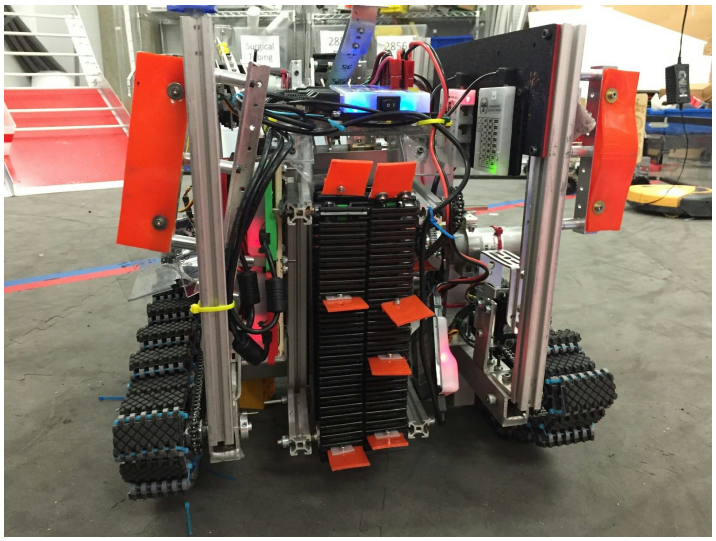
To drive this, Peter tried using 40 tooth gears and a 360 servo. This worked right away and had no problems. This conveyor belt worked well but didn't quite have enough traction. To add traction Peter cut one centimeter pieces of polyurethane and melted them on to the belt with a little bit more than two inches of spacing. The bumps on the belt provided the perfect amount of traction for our final prototype.

Our next steps for our scoring mechanism is to put it on the test chassis. We are driving it around the field. So far, it was worked really well, but had some trouble with the blocks jamming in the collecting mechanism. We attributed this to using two front spinners because the blocks would get jammed in between the two spinners. To solve this we added a belt on the front as well as on the back which solved the jamming. Now that we are using our new chassis, this mechanism is on our robot which we will use for state.



Super Regionals Scoring Mechanism:

Our new Super Regionals scoring mechanism is quite extensive and much different than what we had it state. One of the largest changes is the fact that we have **2 full Tetrix belts** that help us sweep up debris. The blocks are swept up by a staggered series of urethane flippers that rotate a 3D printed tread guide. The debris is carried upward by both the front and back belts which are run by chain and an Andymark motor. The blocks then swept over the top of the second belt and fall into our block dispenser mechanism.



After the blocks go through the Tetrix belts, they fall toward the back of our robot. These blocks are guided by a steel plate which we recently installed. This plate prevents any blocks from falling over the edge and into our wiring. This back wall also guides the blocks when they are on the conveyor belt system. We kept the same conveyor system we had for state because we liked how it could score out either side. Another addition to our scoring mechanisms was the new block dispensing guiders. The **block guide rails allow us to score in the high scoring zone**. However, our robot doesn't score in the high zone from the directly ramp because we have a very unique method. **Our robot scores in the highest bin while we are hanging.** While we are hanging on the top bar of the mountain, our robot's conveyor belt system

dispenses the blocks into the guide rails which help us drop the blocks into the high zone.