

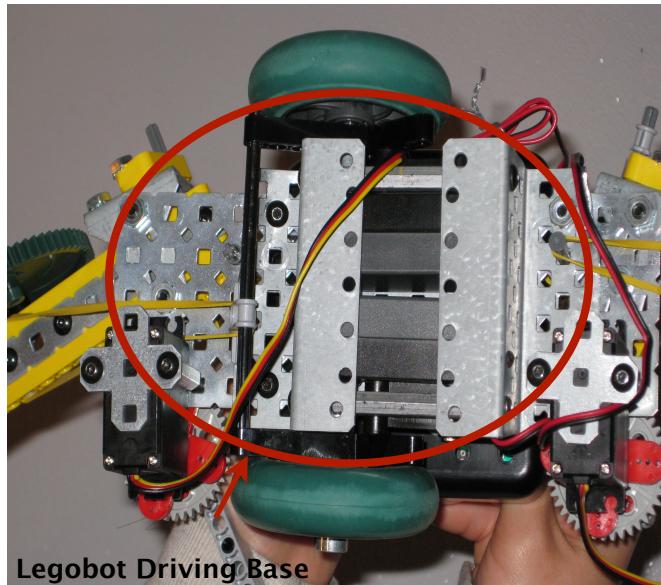
Mechanical Systems

2009 Botball Season Team Number 09-0207

Legobot Drivetrain

Briefly describe how and why your team chose this mechanical system for your robots.

Our team decided to use the drive-train because the base is very stable. Compared to the other two designs we originally implemented, the one that is being used has shown to be far better of a base. The base is able to load a lot more weight than what the other bases were able to. Also, this base provides us more room for additional pieces, because it uses fewer pieces to be built; thus, enabling us more room for more required pieces.



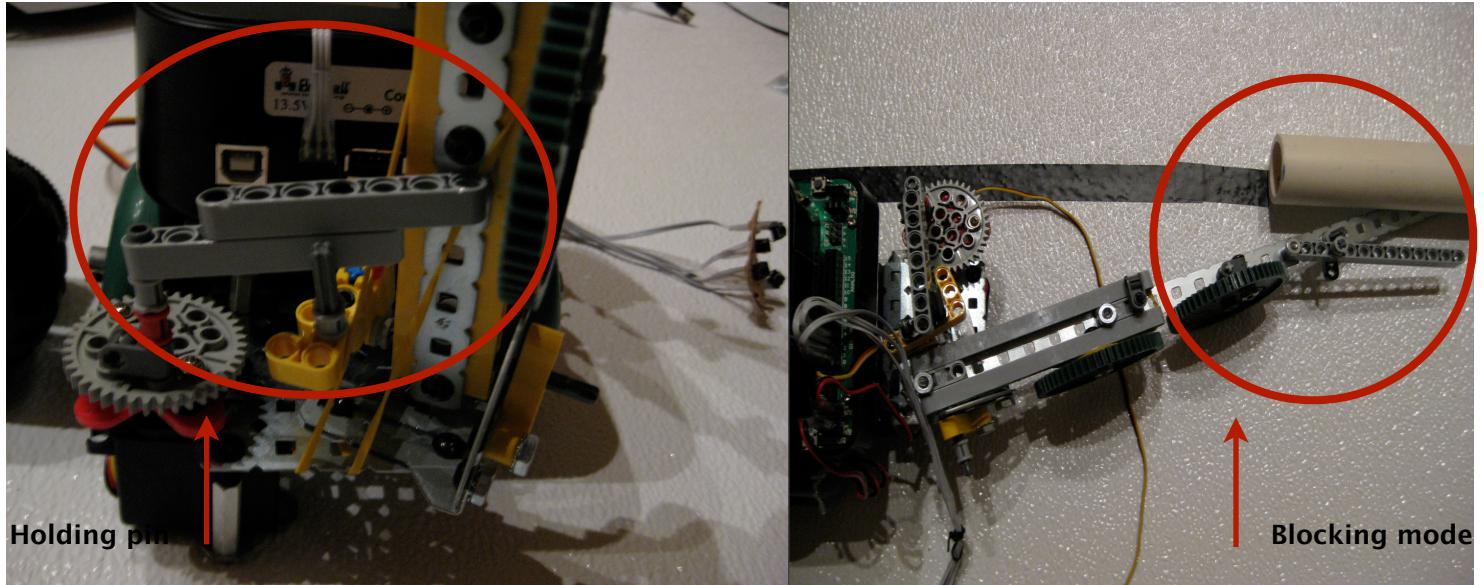
What evaluation process did you use?

We tested the base several times, and found that the base kept bending. We put several amount of pieces on old variations of the base, and this caused the base to bend. We didn't want to take the risk of having a bent base, so we tried to come up with a different type. Also, putting the blockers on the Legobot made the base have to carry a heavier load, and that didn't seem to be much of a good idea, since base bent.

What features of this concept make it your team's chosen concept?

The metal base [without legos] build made it our team's chosen concept. It requires the fewest amounts of pieces, and a very sturdy base. There is also more room for the blockers, as well as room for adding more weight for defensive purposes. The base is also a bit smaller in length and has no lego pieces. The smallness makes it a good design, enabling more room for the Create and its bulldozer. The extinction of lego pieces makes it a wanted design because this lets the lego pieces be useful in other areas.

Legobot Arms



Briefly describe how and why your team chose this mechanical system for your robots.

Our team decided to use these arms and the mechanism by which they lower because they work well as blockers, fit in the very tight space in the Starting Box, and require no motors to actively move down. They are lightweight and simple to implement and upgrade.

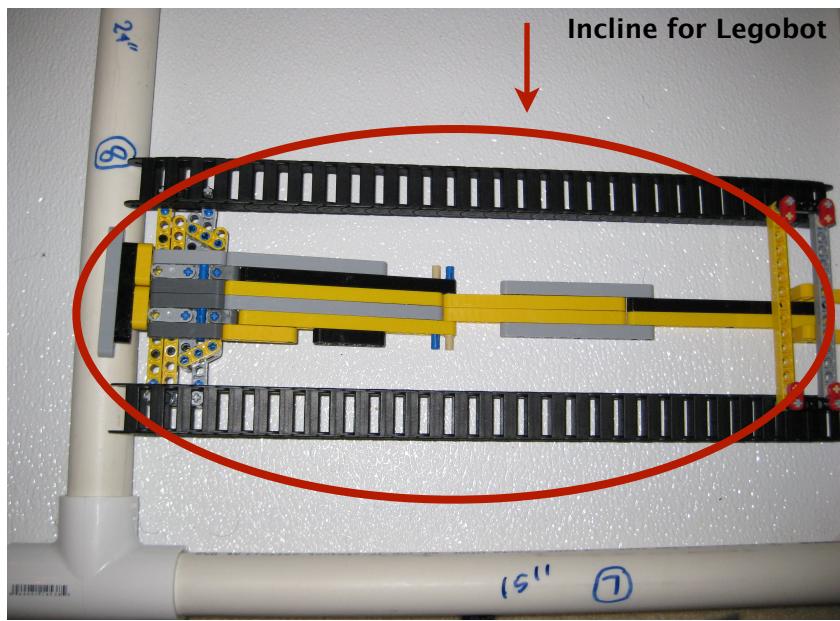
What evaluation process did you use?

We are constantly updating and testing the arms, as they are the main component of the Legobot's strategic purpose. We have transitioned from all lego arms to all metal arms to a combination of the two, adding certain blockers and ways to help the Legobot lock itself in the PVC before the slope. In order to test the PVC, we make use of our directional pad on our CreateBot and continually ram the LegoBot from various angles.

What features of this concept make it your team's chosen concept?

We chose this concept because its arms are the best blocking mechanism to fit in the space. They make our robot compact, but also help a great deal with making our robot a better blocking mechanism against the opposing team's scoring robot, by pushing against the PVC.

Incline



Briefly describe how and why your team chose this mechanical system for your robots.

Our team chose to build an incline so the Legobot is able to get to the opponent's slope as quickly as possibly. The incline is composed of threads and a few Legos. This incline lets the Legobot go over the PVC pipe, saving the time that would normally be taken by going around. The few amounts of lego pieces also is a reason that our team chose this concept, because the Lego pieces may be used in other places.

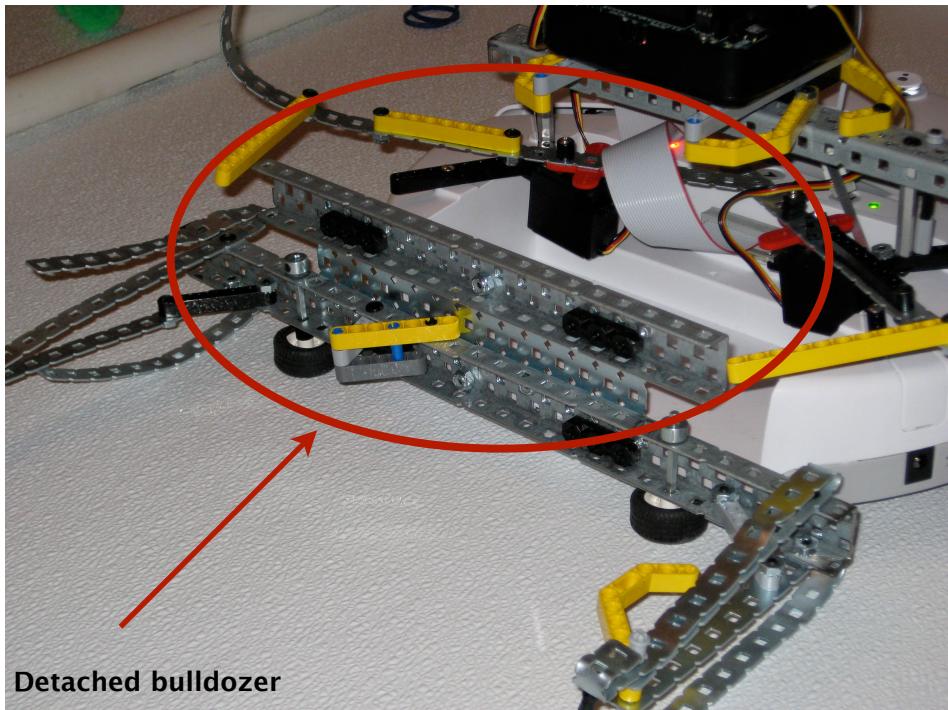
What evaluation process did you use?

We tested the incline with numerous attempts by having the Legobot drive over it. First, we did a simple test to ensure that the Legobot could successfully make it over the incline without any chance of becoming tangled or inhibited by incline structure. This was done repeatedly to ensure consistency of tests. Then, the ramp to slope time was compared with the starting box to slope time, to see how efficient the implementation of the ramp was. The incline merely acts as a ramp for the Legobot to cross the PVC pipes. This improves efficiency of reaching the opponent's slope. The reliability and effectiveness of the incline was tested to determine if the implementation of the slope provided an advantage.

What features of this concept make it your team's chosen concept?

This particular incline made it our team's chosen concept for three reasons. The optimal size of the incline was a huge factor. Also, the incline had to be big enough to carry Legobot, as well as being its optimal size. Another main factor was that the incline had to be small enough to fit in the starting box, as well as give the Create and its bulldozer space to fit enough in the starting box. These three features of the incline, made it our team's chosen concept.

Detachable Bulldozer



Briefly describe how and why your team chose this mechanical system for your robots.

The detachable bulldozer provides serves as dual purpose. First, the bulldozer can be used to relocate items to desired areas. For example, the current strategy will implement the bulldozer so that it will push the water balls and tribbles into the peak area of our base. However, the ability to detach the bulldozer allows for the bulldozer to act as a wall to inhibit opponent bot's movement. Ideally, when the

bot moves, the bulldozer should be attached and move as if it was attached in a traditional, solid-state mechanism. Essentially, this mechanical system solved two requirements our strategy required: to inhibit opponent movement and to relocate objects. This system met these two requirements.

What evaluation process did you use?

First the detachable bulldozer provided a solution to two problems – the ability to move objects and the ability to inhibit opponent movements. Thus, one mechanical system was required to accomplish two goals. In addition to the simplicity of the detachable bulldozer system itself, the system allowed for minimal construction. That itself provided enough reason to prefer the detachable bulldozer. When compared to the “grappler method,” the detachable bulldozer method provides for a much less intense mechanical system, yet, the detachable bulldozer system still allows for similar functionality as the “grappler method.” Thus, two criteria were used to determine which method to use: simplicity of mechanical design and functionality of system. The bulldozer met both criteria.

What features of this concept make it your team's chosen concept?

As previously stated, the detachable bulldozer features two favorable items: its dual functionality and simple mechanical design. These two features made it a desirable design for the bot. The detachable bulldozer requires minimal construction, thus resources can be devoted to other items of the bot. The bulldozer can effectively push objects and also deploy to create a wall against the opponent team. The method used for attaching the bulldozer provides nearly as much stability as a traditional, solid-state attachment.