

# THE TALON TIMES

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## Is the Robotics Season Over?

No, not one bit.

Just because school is out and summer is here doesn't mean robotics has to end. In fact, TALON 540 is a year round deal. The leadership keep on meeting in order to prepare for the new year. Dedicated students also gather, whether at school on certain days or in their own time, to work on creative and interesting projects that they manifest themselves.

So what did TALON 540 have in store for this summer? Let's take a look!

## Summer Projects

### Improving the Oculus Rift

During the summer of 2013, one of our programming members reached out to Palmer Luckey, the founder of Oculus. VR, explaining FIRST robotics and our team, TALON 540. After a few exchanges via email, Mr. Luckey was eager to donate the developer kit 2, the newest installment of the Oculus Rift line, which, at the time, had been unavailable for customer purchase.

Since then, a lot of development has happened with the Oculus Rift. At the beginning of last season, programming began experimenting with the demos for the device, testing out its capabilities with stereoscopic motion and three dimensional environment. Throughout the span of build season, they continued to develop the Oculus Rift, working to implement it into the regular operation of our robot. TALON 8.0.

To do so, two cameras were mounted side by side on the robot with the purpose of creating an artificial stereoscopic view from the robot. These cameras then streamed their video feeds through the field system to the driver station. At that point, the video feeds on the computer were transferred to the Oculus Rift, with the left camera's feed viewed from the left side of the Oculus Rift and the right camera feed viewed from the right side. This ultimately allowed the secondary driver to view the robot's first person perspective in 3D.

Although we were not allowed to use this technology in the actual competition,

the programming subgroup has been improving it this summer and plans on implementing it in future projects this year!



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## Exploring Leap Motion

TALON 540 purchased a Leap Motion sensor at the beginning of the 2012 - 2013 season in order to explore new technologies with the potential to control our robot in a fresh, innovative way. In the previous season, our team managed to win the Innovation in Control Award for using a PSP controller to work the robot. The Leap Motion sensor was our way to extend our research into different control methods.

Initially, the sensor was to be used by the secondary driver to operate different components on the robot. This was accomplished, but it was not actually used in competition, because it didn't prove to be precise enough.

After the season ended, however, we decided to change the sensor's use and programmed it to control the robot when the driver operated it with both hands. This implementation worked better, because the action of driving the robot doesn't have as many precise actuations as the pistons and other actuators.

This summer, the team has been exploring the possibility of using the Leap Motion sensor in cooperation with the Oculus Rift. With this combo, the person operating the Leap Motion sensor would not have to see the controls to manipulate them with his or her hands, which mitigates the disadvantages of obscured vision by the Oculus Rift.



## Using Augmented Reality

Augmented Reality is an indirect view of a physical world environment whose elements are “augmented” by computer generated sensory input such as sound, video, or graphics. With the help of this technology, the information about the surrounding real world becomes interactive and digitally manipulable to the user. Last year, TALON 540 started to use this Augmented Reality feature in order to make its most recent robot more accessible to the public. In order to access this 3D rendered version of the robot, the public could simply download a free application by the name of Augment® through the App Store or the Google Play Store and scan a QR code in order to access the detailed three dimensional version of the robot. In addition, people could zoom in and out to analyze the specific parts and elements of the robot.

Over the summer, we have been building on this prototype by adding color and using this feature to make all of the robots of the team accessible to the public.



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*"All these summer projects are an excellent feature of bringing the hard work and success of the team principles of STEM to the hands of the user."*

— Nidhi, Programming Member

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## The Purge: TALON 540 Edition

In addition to the exciting summer projects, TALON 540 finally tackled the overwhelming task of purging and cleaning our robotics hall, the little storage space were we house our robots, totes, crate, and much much more. The tedious, but necessary, chore was a collaborative effort among the mechanical subgroup, a now fused force of build and pneumatics members. And the experience proved to be "a great team building exercise for the newly formed subgroup," as Alex, a mechanical member says.



As a unit, the TALON 540 members worked long and hard on organizing all of the materials and robots. Over the course of three meetings and many hours, the large subgroup was finally able to clean up the hall. Now through putting things back where they belong and only taking out what we need, TALON 540 hopes to be able to keep the storage area clean for many years to come.

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