

# The Daily Spread



Volume 2, 2013: A Year in Review—A Look Ahead

Fall 2013

## SOUTH LYON ROBOTICS

### A visit to the University Of Michigan CS4HS Program

The Robotics Team was invited to present at the CS4HS Conference at the University of Michigan Computer Science Department, at the Bob and Betty Beyster Building on August 21st. The students presented how the FIRST robotics program promotes STEM and STEAM, as well as promotes the



upcoming Common Core. Moreover, the employ-ability skills, connections and achievement results in increased classroom engagement and increasing the female population in technology. They did a fantastic job! Apart from the demonstration for the CS4HS workshop of over 60 high school teachers, they met with the Admissions Department and took home a bag full of literature and information plus they got a guided tour of North Campus including the nano lab and student team workshops. (see college visits on page 2)



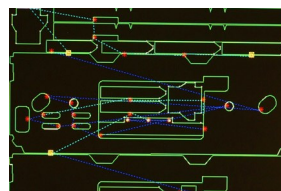
For more information, go to: <http://www.eecs.umich.edu/cse/CS4HS/agenda.html>

### A Toast To An Outstanding Partnership — Superb Fabrication, LLC

The success of our 2013 year would not have been so great without the help of Superb Fabricating located at 330 N. Reese St. South Lyon, MI, 48178, (248) 684-5297. Using their state of the art laser cutting machinery as well as CNC benders, they were able to take Solidworks files from our CAD design of our robot and manufacture the launcher, hopper, control horns and our prototype floor pick up arm. A big thank you to Jon Stricker and his

team in getting the parts so quickly and so precise. Lucas B remarks, "In 2013 we gained one of the most important resources the Flying Toasters have in our network, Superb Fabricating LLC. The services they offer our team are amazing and allow us to compete with the highest calibre teams. We proudly dawn the Superb logo on our robot to show how gracious we are to have them as our sponsor. The

excitement Superb Fabricating has towards working with us is just amazing. I'm personally very excited to work with Superb in 2014. I know that with their help, we will be ready to have a world class robot. "



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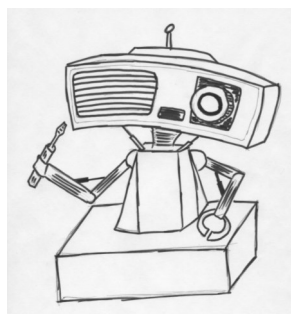


### TEAM Note —

In keeping with the student-oriented nature of team 3641, even the robot construction is predominantly student work. While mentors are vital to the team's success, The Flying Toasters firmly believe that it should be the students who do the work in order to foster a better learning environment. Robot parts are fabricated by hand in the machine shop by a student specialist, and the team even brings along a portable workshop to tournaments to create

new parts if necessary. Team 3641 often aids other teams in need at competitions by allowing them to use tools, or by actively helping them to create or fix the desired part. Another integral component to our team's identity also began in 2012: A student-run government. The founding students banded together and formulated the Articles of Incorporation, which laid out the basics for the various roles and duties of student leaders. A system

of cataloging tasks and work hours was developed, and has enabled the team to award varsity letters to qualifying student participants. These organizational methods have proven extremely effective, and give students extensive experience with managerial roles and leadership skills. —2013 Chairman's Essay



A robot walks into a restaurant, orders a beverage, and lays down some cash.

The waiter says, "Hey, we don't serve robots."

And the robot says, "Oh, but someday you will."

*"There is nothing more exhilarating than witnessing your creation, a machine you have been pouring your heart and soul into for weeks, come to life for the very first time.*

*It all began on paper as a breakdown of strategic importance and innumerable concept sketches, progressing into the rough prototyping stage; once cardboard cutouts*

*and rubber band-powered conveyer belts resembled something close to a functioning robot, it was time to build the real deal. A robotics competition is not quite like anything else you will ever see; unlike sporting events, robotics promotes a friendlier environment of 'coopertition,' in which every single student is able and willing to help one another regardless of*

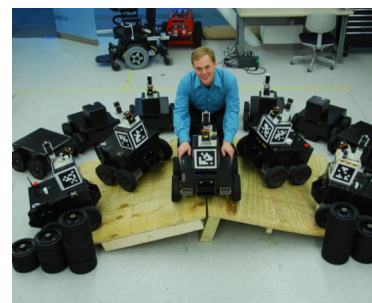
*which team they are from. In this activity, high school students and industry professionals work side-by-side to create some truly remarkable solutions to a common challenge — no two robots are exactly the same. Robotics celebrates the potential in all of us to innovate, to lead, and to shape the future which lies before us."*  
-Kerry P.

### College Visits: University of Michigan

Going to University of Michigan and seeing the campus was quite an experience. We got to show our robot to the staff, which was nice considering we are usually presenting our robot to peers. Much of the staff was very interested in our robot, so we gave a demo outside shooting Frisbees. In return we got to take a tour around the

engineering campus. There were so many different departments. We got to see the clean room, where nano technology was being researched, and the racing dune buggies, of which one of them won the competition. It was interesting to see the campus and how it operates, considering that in a few years, I could be among one of

the students walking to class.—Ethan N.



## C.O.I.L.

COIL stands for “*Covert Operations, Intelligence, and Legal.*” This group specializes in team espionage and rule interpretation. It is a necessity for incoming members to know and understand all rules and regulations regarding the challenge, and should be willing to communicate with other teams about their machines and strategies. The team which COIL represents, Team 3641 The Flying Toasters, increased its standings upon incorporating scouting into its routine. Our team also found

## Boosters Info

All parents and mentors are invited to be a part of the Robotics Boosters. Please send your email address to the Booster Secretary at [baperion@comcast.net](mailto:baperion@comcast.net) to get on the email list for booster news and meeting minutes. Booster meetings are held several times a year. All are welcome to attend. In addition, five Board members are elected each year. The term

## Community Outreach

The team did several community outreach activities to promote FIRST. We went to area elementary schools to demonstrate our robot to gain interest in robotics. Some South Lyon Boy Scout and Girl Scout troops were invited to see our robot and we helped them earn some badges. One

great success by scouting its own actions to pinpoint fundamental problems in our operation. Using the information from this feedback, our exhausted drive team

was able to make an incredible comeback at our second tournament.



## A Personal Account

I, Chaz Schooler, worked primarily on the autonomous operations of the robot. This included a vision processing algorithm that worked well in testing, but was met with severe problems when deployed on the field. Ultimately I was able to reprogram the robot using a style of “dead reckoning” where the robot makes assumptions about its position, and the autonomous vision processing was successfully implemented using an independent Hackberry A10 board but never integrated back into the robot’s control system. “It worked perfectly in testing, but when it got on the field the robot did the Harlem shake.” I was able to successfully derive the distance between the robot and the target using a single image, and the angle between the camera and the plane of the ground. I look forward to seeing you guys at kickoff for the 2014 FRC season.

for current board members runs from May 2013 to April 30, 2014. Current board officers include: President (Jen Debler), Vice President (Sherri Heffernan), Treas-

urer (Barb Brodesser), Food Coordinator (Christina Novilla), and Secretary (Bridget Perion). The Booster Board looks forward to meeting you. —Bridget Perion

Lyon Robotics team through our booth games and FIRST competition video. In addition, the team gave a presentation to the school board of what we had presented to the judges during our FIRST chairman’s presentation.—Amanda P

## Engineering Inspiration



Engineering Inspiration Medal—  
The Flying Toasters won EI at  
Livonia District

Last year The Flying Toasters went to Livonia Churchill and dominated the competition but that is not the only thing we did there; we also won the Engineering inspiration award. This award is for teams that go into their community and inspire people into S.T.E.A.M. even though we won this award we were not quite ready for it. In less than a week we had to have a

whole presentation down and memorized, but as a group team 3641 decided to use the same presentation we used for the chairman's presentation. A week later we went to the states competition and we did the presentation. Unfortunately we didn't win the award again.

This year I would like to have a presentation

ready. In case The Flying Toasters do win the engineering inspiration award again. This is going to take a lot of preparation and hard work to put together a nice and well done presentation. Although, we have a small team I believe that we, as a team, can do this as long as we are determined and stay on task team 3641 can make it even further this year. - Aaron B.

**“Trying for this award means being a good team, running on the fundamentals of FIRST, and just being willing to share your work with others.”**

## Chairman's Award Team

The Chairman's award is the most prestigious award is FIRST; it signifies that your team is the one that others should aspire to be like. This doesn't limit itself to just one season, this requires that it be an ongoing excellence for several years, past and future. The winning teams are examples that transpose the game of the year, showing development and organization that serves well every year. This is exemplified by the fact that the winner at Worlds can return every year, while the World champions are only guar-

anteed one. For our team, the Chairman's award is simply recognition for activities that we would do regardless. All the work done to "look good for Chairman's" is really just a motivator to continue our work. Trying for this award means being a good team, running on the fundamentals of FIRST, and just being willing to share your work with others. For the Flying Toasters, its second nature. We have students do most of the work, so that they can learn, develop their skills, teach others, and be prepared

for their future. Being student-led, we ensure that each person has a chance to speak, and allow everyone a say in where our team is headed. And honestly, its fun, and we want to share the fun with everyone. When you are founded on these principles, the award just means doing what you came to do.

-Patrick Humfleet  
Former VP -Team 3641  
(2012-13)  
Mentor -Teams 3641,  
857, 2586 (2013- )

## Build Team

With the 2014 season fast approaching, the build team is gearing up to try and give us the best chances for the team to make it to the world finals. We learned a lot from 2013, but overall we realized the mistakes we

made and are on hot pursuit to fix them. For example, we are prototyping a custom drivetrain that will give us more room for electrical components, allow for the mounting of modular components, and save us 10-15lbs over

previous design, which is great for fulfilling our 120lb weight limit. With this and other new innovations, the team will definitely be ready for the Flying Toaster world invasion of 2014.



Students frantically putting together the competition robot in preparations for the Gull Lake District Competition

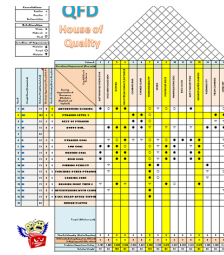
## QFD—Quality Functional Deployment

One of the biggest questions we get asked is how we come up with our designs. Some teams may tell you that their design is inspired from things we use everyday, but how do you get to that point where you know what to accomplish with your de-

sign. The Flying Toasters have been solving this issue with a sophisticated tool called QFD or Quality Functional Deployment. QFD allows us to analyze the aspects of the game along with characteristics our robot may possess. By looking at these

comparisons we can assign strong, moderate, or weak correlations between these scoring options and the robot itself. The final output is a calculated percentage of importance that shows us what needs to be our number one priority while simultaneously telling us what characteristics that part needs to be designed for.

—Lucas B.



“House of Quality” graphic organizer is used to show the relationships of all the elements involved.

## From the Parent Boosters President...

Greetings,

I'd like to take this opportunity to say congratulations to our returning veterans on such a successful season last year, and welcome to our new team members.

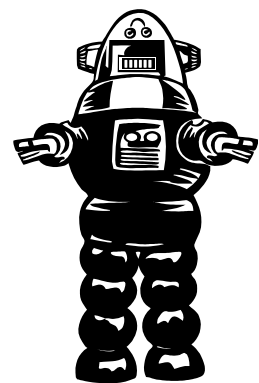
When someone asks me about the robotics team I like to tell them, if your kid is on the team, the whole family is on the team. This is somewhat of an understatement. The team needs involvement from everyone, it takes a village to raise a robotics team. As a parent of one of the founding members and a 2013 graduate, I've seen first hand the positive impact robotics has had in my son's life. In three short years, I've watched the toasters grow from the dream of a few students, to world contenders.

As president of the boosters, I urge you to get involved with our parent group. We do a lot of beneficial things for the team. There is a lot of behind the scenes things to do, that help our team run smoothly. Parent volunteers provide team dinners so our kids don't eat pizza, night after night, we raise money to help with robot build and other things vital to our kids success. We host the awards banquet, and have run robotic events. The boosters meet regularly, and we would love for you to get involved in our core parents, who help with different aspects of our team.

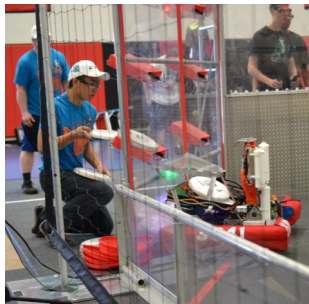
There are many ways to be involved, from boosters to mentoring, whatever amount of time you can give, robotics is an amazing program, that helps these kids become, responsible, productive and thriving adults. I look forward to another award winning year and working with each of you. If you would like to be on the boosters mailing list, please send an email to myself [jendeblor@gmail.com](mailto:jendeblor@gmail.com) or our boosters secretary Bridget Perion at [baperion@comcast.net](mailto:baperion@comcast.net)

Thank you for your time and your choice to join this amazing team.

**“The team needs involvement from everyone, it takes a village to raise a robotics team.”**



## A Note From the Treasury, Fundraising, & Budget



We started off our FIRST 2013 season with a sponsorship from SAIC which basically paid the entry fee into FIRST, but we had to work hard to raise a total of \$14K for entrée fees plus another \$12K to cover expenses for a total fundraising of \$26K in the 2013 season. Competing in Robotics is an expensive learning experience. A single event can cost as much as \$5,000, just to enter! That does not include the cost of building

the robot! We are raising our funds for the 2014 FIRST season and unfortunately, we are a long ways off. So in the face of this, we turn to our gracious partners for their continued help. Currently, with the help of SAIC and TRW, we have the \$5K veteran registration fee for the 2014 year covered and will be completing the STATE of MICHIGAN Grant that Gov. Snyder established to help out FIRST teams by paying their State and World regis-

tration fees. If you are not already a partner or would like to become a partner, please contact coach Ron Weber at [weberr@slcs.us](mailto:weberr@slcs.us)



## Drive Team

There are four positions on the drive team: the driver, secondary driver, human player, and coach. This group of people is not simply picked or volunteered for. In order to be on the drive team, one must show that they have an adequate ability to perform the necessary tasks. First off, the driver's job is much tougher than many perceive it to be. It takes a lot of skill and practice to be able to

make all of the maneuvers necessary to be a winning robot. The secondary driver operates most of the robot's functions that aren't related to the driving itself. The human player is the one that puts game pieces into the robot and can do some scoring toward the end of the match. Then there is the coach. The coach has a very important job which involves the communication throughout the

drive team during matches. This year we had a very good combination of skilled students on the drive team and were able to communicate effectively and efficiently which was one of the main reasons that we were able to make it to not just state championships, but world championships for the first time.— Scott B.



## The Success of Our Team

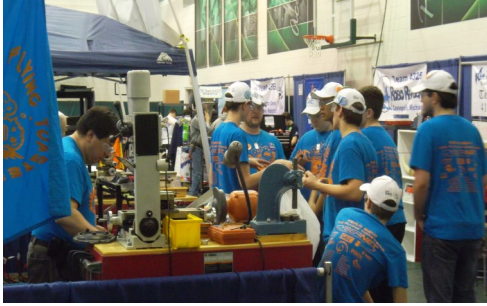
For a team still so young, The Flying Toasters have already left an enormous impact on the community and participating individuals,

and still seek to continually improve. "We shall inspire and intrigue our community by demonstrating that which we know and love, unite inter-

disciplinary subjects and skills, and achieve greatness in our pursuits." -Kerry P.

## 2013 HIGHLIGHTS FROM A TOASTERS POINT OF VIEW

Last year of FIRST Robotics was a blast! Giving every teammate experience and knowledge of how things work. We also had to say farewell to many friends who graduated that year. Here is a recap of some of the events that occurred during FIRST season.



The first event, which was the smallest but not any less important, was visiting Hardy Elementary School. Since the Elementary school was inside the South Lyon district, this became an easy task of coordination and travelling. Also, the children there are most likely to come to South Lyon High Schools when they grow up. We had set up in the cafeteria

and showed the children how we maneuver and even built a makeshift goal to use. Our accuracy was pushed to the limit as we attempted to fire a Frisbee from their basketball court into a basket on a pole far off in the grass. We were making about 8-10 shots per 20 in the beginning, but the amount of shots made grew in streaks. All the students loved the robot and hopefully, they're influenced by the excitement to be a toaster in the future.



The second event was at the Indiana Robotics Invitational. We were invited to travel all the way to Indianapolis, Indiana to partake in their annual robotics invitational. Only 69 teams were invited and actually came to compete. We may not have placed high enough to be in the final part of the competition, but we received much needed data on our skills and what we needed to work on. The travelling took about four hours of driving there and back and this event proved slightly disappointing, but inspirational on how hard we must work next year.

Finally, the third event was the Livonia district robotics competition. At Livonia, we flew across the field, scoring points with our eyes on the prize. We placed high in the rankings and even won the engineering inspiration award, which gave us a sweet ticket to the FIRST state finals, but we had to afford the registration and trip there and back. This even revolutionized our thoughts of our robot's look. We removed the piece that held our pyramid climber and made it possible to slide under the pyramid and for better maneuverability. We, The Flying Toasters, had proven to all of Michigan that we were capable of great things. -Chris T



## 2013 HIGHLIGHTS FROM A TOASTERS POINT OF VIEW

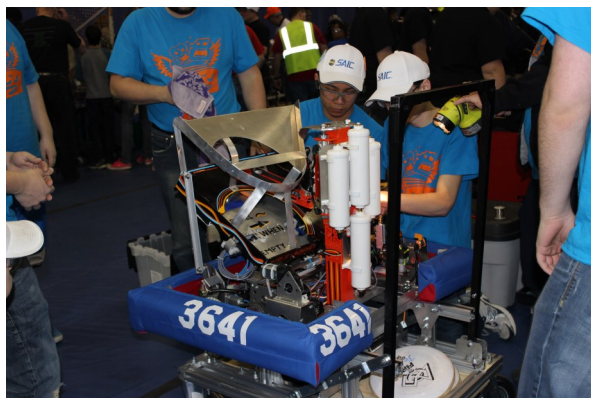
Many emotions flooded through me when I heard we were going to worlds. The first one, no doubt, was excitement. The second one, however, was relief. At first, I was confused as to why I felt this way. Why would I feel 'relieved' that we were going to worlds? The answer eluded me for about 10 minutes as I thought of how our team got to this position. The first memory that came to me was the day of kickoff.

We all sat there memorized by the screen in front of us, as we watched the game video for the first time. As soon as the video ended, it was all business. We met in a conference room with the official rules of the game and began to pick them apart. We spent hours learning the rules forwards and backwards, looking for the best ways to score points, and the best ways to stay penalty free. By the end of that day our team practically had them memorized. The next memory I thought of was the day we did QFD.

One late night at South Lyon East, mentors, students, and coaches all met to discuss the design of the robot. For over 2 hours, we weighed possible aspects of the robot against concepts of the game. In the end, we had derived a non-biased concept of what the robot was to become. After thinking of that night, my mind jumped to all the Mondays and Fridays of prototyping and building. I can't possibly begin to describe how many hours our team put into that robot. I can recall countless Mondays and Fridays nights where we had worked till 9pm. If that wasn't enough, some team members took it upon themselves to work on the robot on weekends. These three memories all had something in common. They all showed demonstrations of our teams dedication, hard work, persistence, and drive. I now knew why I felt relieved about going to worlds. Our dedication, hard work, persistence, and drive was finally paying off, as I knew it one day would.



So, we were off to worlds. The immensity of the competition didn't hit me until I actually got to St. Louis. I don't think many other sports teams can say that they could look across the aisle and see an Australian team; and then to the right of them, an Israeli team. It was then I realized that this is a truly international sport. I



found it quite amazing to see 400 teams of the world's most innovative students and their robots compete. It was definitely going to be an uphill battle for our small South Lyon Team. Fortunately for us though, we came prepared. By the end of 5 qualifying matches, we had 5 wins and 0 losses. I looked up at the scoreboard to see that we were first in our division. The last three qualifying matches we endured were even harder. We managed to finish our matches off with a record of 6 and 2. With a rank of 17 out of 100, we got picked for elimination rounds. In the quarter finals, (which are played best 2 out of 3), we won the 1<sup>st</sup> match. The other alliance came back hard the second and we barely lost it. It all came down to the third and final match. Just as we begun, one of our alliance member's robots shut down. We played the match practically 2 vs. 3 and lost by a mere 10 points. It had definitely been a good run for us, as we played our hardest. We later found out that the teams we played against in the quarter finals went on to win the whole competition.

I think that I speak for the team when I say we couldn't have hoped for much more. It turned out to be a great season, winning the chairman's award, winning a district competition, going to states, and then continuing to go to worlds. The experiences throughout this 2013 season, have led our team to learn and grow so much. There's definitely a good chance that we will be going back to St. Louis next year, getting another shot at that 1<sup>st</sup> place trophy. —Ethan N.

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## SOLIDWORKS SIMULATION & ROBOTICS

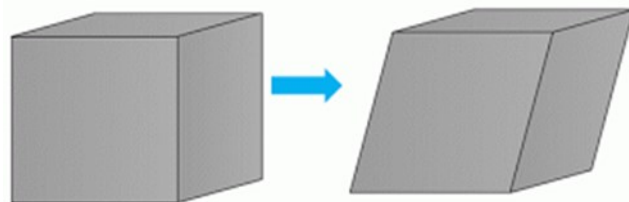
### What are Von Mises stresses exactly in layman's language?

Good question. Von Mises Stress is actually a misnomer. It refers to a theory called the "Von Mises - Hencky criterion for ductile failure". In an elastic body that is subject to a system of loads in 3 dimensions, a complex 3 dimensional system of stresses is developed (as you might imagine). That is, at any point within the body there are stresses acting in different directions, and the direction and magnitude of stresses changes from point to point. The Von Mises criterion is a formula for calculating whether the stress combination at a given point will cause failure. There are three "Principal Stresses" that can be calculated at any point, acting in the x, y, and z directions. (The x,y, and z directions are the "principal axes" for the point and their orientation changes from point to point, but that is a technical issue.) Von Mises found that, even though none of the principal stresses exceeds the yield stress of the material, it is possible for yielding to result from the combination of stresses. The Von Mises criteria is a formula for combining these 3 stresses into an equivalent stress, which is then compared to the yield stress of the material. (The yield stress is a known property of the material, and is usually considered to be the failure stress.) The equivalent stress is often called the "Von Mises Stress" as a shorthand description. It is not really a stress, but a number that is used as an index. If the "Von Mises Stress" exceeds the yield stress, then the material is considered to be at the failure condition. The formula is actually pretty simple, if you want to know it:  $(S1-S2)^2 + (S2-S3)^2 + (S3-S1)^2 = 2Se^2$ , Where S1, S2 and S3 are the principal stresses and Se is the equivalent stress, or "Von Mises Stress". Finding the principal stresses at any point in the body is the tricky part. The von Mises theory is simply one of several failure theories used to determine the applied stress in a member. It combines principle stresses, from Mohr's Circle (bending & torsion), into an equivalent applied stress which is compared to the allowable stress of the material. In some sources, von Mises is also called the Distortion-Energy Theory. There are several failure theories available. The Maximum Normal stress theory is the most conservative of failure theories and is used for brittle materials. The von Mises theory is used for ductile materials and is seen most often when evaluating stresses, both static and dynamic, for shafts.

Use of Von Mises stress. Von mises stress is considered to be a safe haven for design engineers. Using this information an engineer can say his design will fail, if maximum value of Von Mises stress induced in the material is more than strength of the material. It works well for most of the cases, especially when material is ductile in nature.

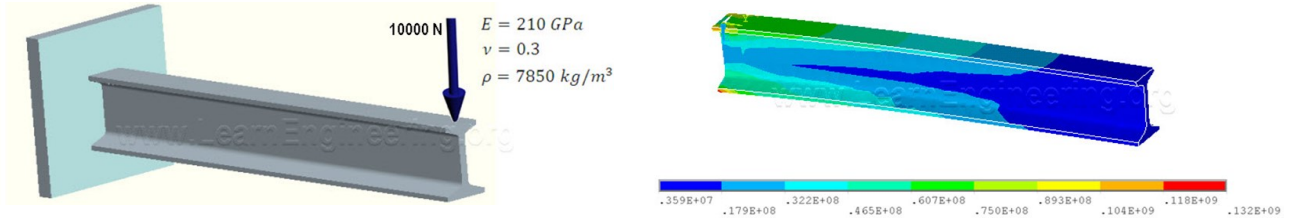
Distortion energy theory. Concept of Von mises stress arises from distortion energy failure theory. According to distortion energy theory failure occurs, when distortion energy in actual case is more than distortion energy in *simple tension case* at the time of failure.

Distortion energy: It is the energy required for shape deformation of a material. During pure distortion shape of the material changes, but volume does not change. This is shown in figure 1.



Industrial Application of Von Mises Stress: Distortion energy theory is the most preferred failure theory used in industry. It is clear from above discussions that whenever an engineer resorts to distortion energy theory he can use Von Mises stress as failure criterion. Let's see one example. Suppose an engineer has to design a cantilever beam using mild steel as material, with a load capacity of 10000 N. Materials properties of mild steel are also shown in figure. Yield stress value of mild steel is  $2.5 \times 10^8$  Pa. He wants to check, whether his design will withstand the design load.

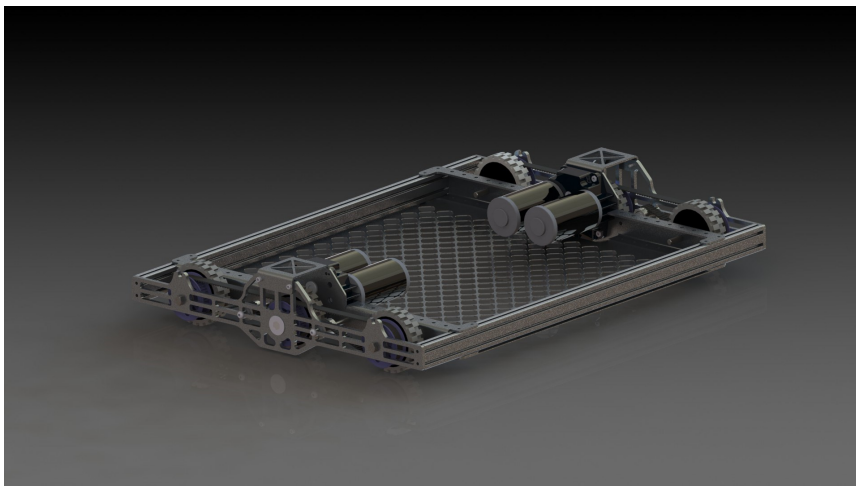
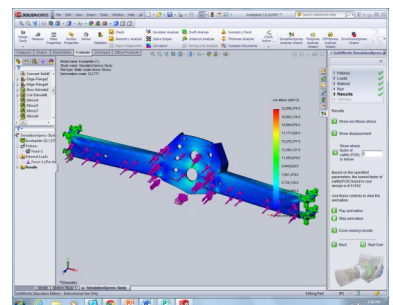
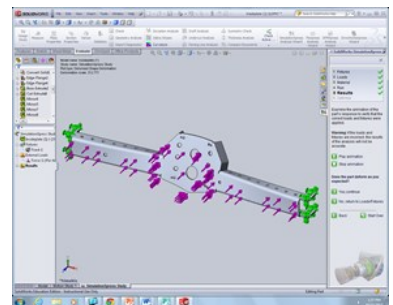
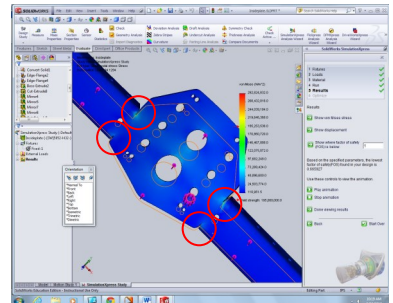
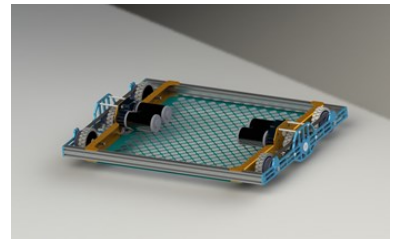
# SOLIDWORKS SIMULATION & ROBOTICS



One can note that Von Mises stress is maximum towards the fixed end of the beam, and the value is  $1.32 \times 10^8$  Pa. This is less than yield point value of mild steel. So design is safe. In short an engineer's duty is to keep maximum value of Von Mises stress induced in the material less than its strength.

## How does this type of simulation help our robotics team?

In the development of on a new chassis design, there was a concern that the fabricated part that the transmission drive attaches to would not be able to hold up to the stresses (see the gold colored part at right). Based on this concern, the individual part was subjected to the Solidworks Simulation whereby the Von Mises stresses analysis indicated that stresses would exceed the yield strength ( $195,000,000 \text{ N/m}^2$ ) and thus a crack would probably form in the corners where the C-channel bend met the transmission mounting face. (See second picture at right with the critical areas in red circles). Due to the probability of failure, a redesign was needed. After much conversation, brainstorming and consideration of solutions, it was thought to add a stiffener that would be possibly welded or riveted and thus stiffening the c-channel bend and making the joint stronger. With this new design, Solidworks Simulation was again used to test the part (See the third picture down on the right). Von Mises stresses were observed to have been greatly reduced by almost a factor of ten from  $195,000,000 \text{ N/m}^2$  down to  $19,084,596 \text{ N/m}^2$ . With this new design, the parts are ready to be sent out for laser cutting, bending, and assembly. How cool is that?"



## FIRST KICKOFF 2013 at NOVI

This year, we attended the FIRST kickoff at Novi High School, hosted by team 503 (Frog Force). We saw this years game, Ultimate Ascent, and got introduced to the rules. Immediately, we started drafting ideas. After the kickoff at Novi, we went to Bosch and worked with team 862, Lightning, to do our QFD (quality function design) to determine what ideas would work best for this years robot. Ultimately, this was a very productive experience towards the robot we would create.—Luke W.

## GULL LAKE COMPETITION

Gull Lake was a special event to us. One of our goals for the season was to attend a competition that was farther away then the near by ones we've attended before. This one was a good few hours away. So on the weekend of March 8th we headed out to our first competition.

During this event we learned that being fast and accurate would allow you to succeed. Using this tactic we made it to the semifinals. Team 2000 chose us and team 4377 to join alliance number 5.

However in the end we lost against teams 2959, 3618, and 3452. Those teams lost to teams 3656, 3547, and 3452.

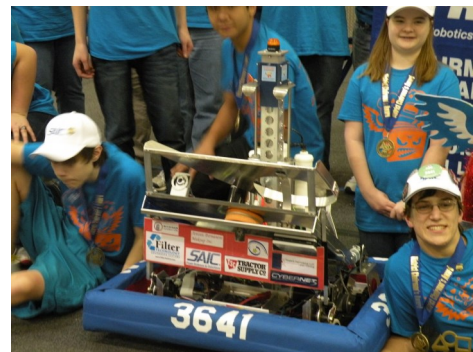
Thanks to our drive team, coaches, scouters, and everyone else there we managed to get where we did. Not too bad for our first event of the season.—Connor H.



## CHAIRMAN'S AWARD



When we attended Gull Lake we may not have won but we did not come out empty handed. We won one of the hardest awards to get, Chairman's. That award is given to the team that can present what makes there team what it is. This does not only mean the robotics side of robotics but also the public side. You have to speak of how you reach out to your community and how your team as a whole functions. You have to explain how your team is different than every other team. And at the Gull Lake our team won this award. This award is also focused on how your team spreads the word of first. Thanks to our three speakers, Kerry P., Lucas B., and Patrick H., they presented our speech and lead us to winning this hard to get award. By winning this award, it allowed us to compete in States. —Connor H.



## LIVONIA DISTRICT COMPETITION

Churchill, our second competition of the season, taking place on the weekend of March 29th. This event allowed us to try out the skills and tricks we learned from the previous event and the weeks following it. Once the competition started we started to notice the practice and work paying off. However with the Chairman's award under our built we didn't have to worry about not winning an event. However we decided against it. Due to our

drive team's teamwork, our hardworking scouts, and the support of the coaches and the people watching, we managed to get 9 wins out of our 12 games. This put us in third place, which allowed us to be the captain of the 3rd alliance. Using the data that our scouts collected we invited teams 862 and 3414 to join our alliance. With our alliance created we managed to make it to the finals. It was our team versus team 2620, 1189, and 27. The first match we managed to win by 29 points. And the next one by 8. We won the competition. We managed to secure a second ticket to States.



However the difference is that this focuses on engineering. It focuses on how you bring people into the idea of engineering. Well, After a speech similar to the Chairman's, made by the same people, they allowed our team to win that award as well. This award also allows you to compete in States, just like Chairman's. —Connor H.

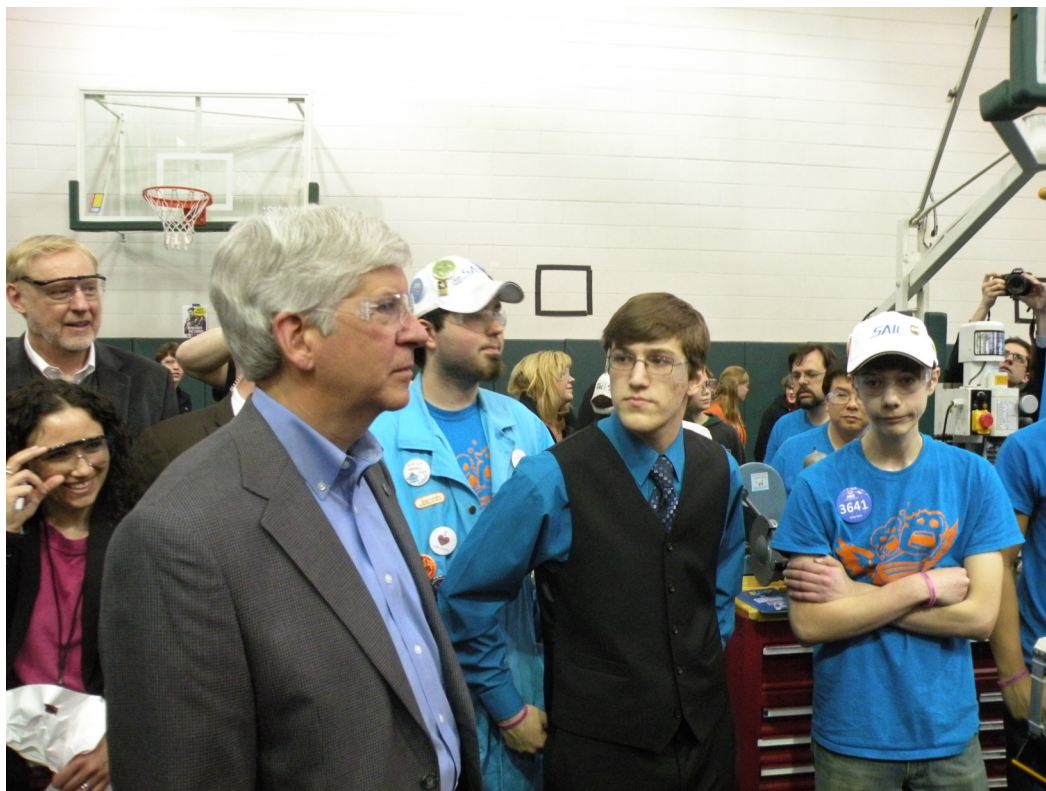


However, that's not all that happened. There was one other award we won. This award is called Engineering Inspiration award. It's similar to the previously won award, Chairman's.



## Michigan State Championships

States was an interesting event that took place around April 11th. It was our first time making it there, and we saw many interesting robots, like many that could climb to the top of a pyramid. In most of the matches the winners got over 100 points. Throughout the event we managed to win seven of our twelve games. This enabled teams to notice our team when it came to the alliance selection. Team 3414 invited us and our good friends Lightning, Team 862 (Thanks for the help with scouting). Together we managed to make it to the semifinals. We didn't win any awards at states, but in the end we still came in a high enough spot to be able to go to Worlds. —Connor H

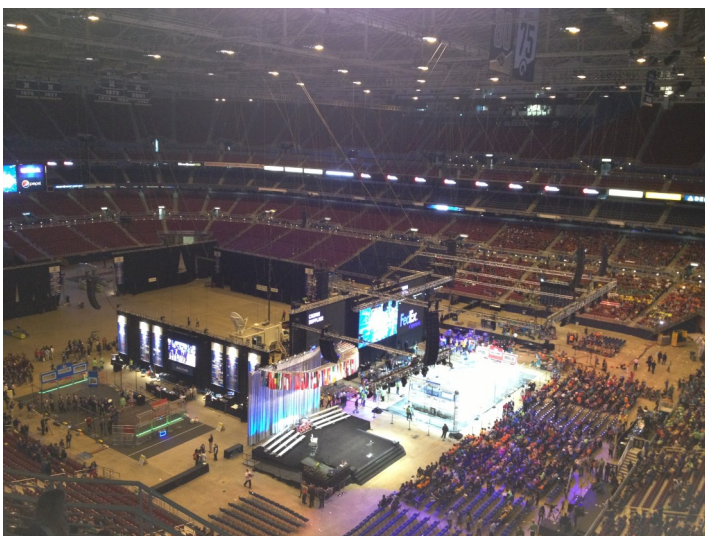


A visit with Michigan's Governor Snyder. Team 3641 answered the many questions our governor posed about the robot, team dynamics, sponsorship, and business contacts.

## WORLD CHAMPIONSHIPS

World's was even more interesting than states. States took place around April 24th. However unlike every other event we attended this was out of state. To be exact, this was in St Louis, Missouri. A good nine hours away. But it was interesting none the less. This took place in the professional football stadium in St. Louis. There were so many teams at this that all the teams was split into four groups. We got placed in Galileo. Over time we won 6 of our 8 games. For a while we were even in first place. We allied with teams 2630 and 111. In the quarter finals you had to win two out of three games. The first one we won by 17 points, while in the second match we lost by 15 points. And in the third and final match we lost by 39 points, however during this match one of robots stopped working. But more importantly the teams we lost to were the teams that won the world championship.

- Connor H.



Event GALILEO Rankings		Menu
<b>3641</b>	The Flying Toasters 10 QS, 188 AG, 140 CLIMB, 334 TGF	Rank: 1 (5-0-0) >
<b>222</b>	Tigertrons 10 QS, 186 AG, 100 CLIMB, 441 TGF	Rank: 2 (5-0-0) >
<b>3528</b>	Up Next! 8 QS, 234 AG, 110 CLIMB, 260 TGF	Rank: 3 (4-1-0) >
<b>245</b>	Adambots 8 QS, 216 AG, 90 CLIMB, 431 TGF	Rank: 4 (4-1-0) >
<b>2512</b>	Duluth East Dared... 8 QS, 210 AG, 100 CLIMB, 474 TGF	Rank: 5 (4-1-0) >
<b>2729</b>	Storm Robotics... 8 QS, 196 AG, 130 CLIMB, 388 TGF	Rank: 6 (4-1-0) >
<b>2169</b>	KING TeC 8 QS, 178 AG, 130 CLIMB, 375 TGF	Rank: 7 (4-0-0) >
<b>3941</b>	Absolute Zero Ele... 8 QS, 168 AG, 130 CLIMB, 265 TGF	Rank: 8 (4-1-0) >
	Robo-Lions	Rank: 9 (4-1-0)

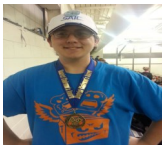
There isn't really a single word to describe the world competition. I could say that I was in awe that we had made it, but I could also say that I was nervous to be facing such hard competition. It was quite a mixed bag of emotions, but in reality, I was just so excited to be there. The venue was quite impressive. The stadium was huge, with 4 competition fields going at the same time. Our division, Galileo, was composed of 100 teams from all around the world. Walking up and down the isles of the teams, you could travel from the U.S.A, to Canada, to Israel in a matter of less then 100 feet. It was amazing to see all these teams under one roof, all competing for the same goal. We fought till the very end, barely being edged out by the other team in the best 2 out of 3 matches. Losing to the 3 teams that won it all, by only a few points, I would say that we were pretty successful being first year World competitors. Seeing how well we did last year, there's a good chance that we will be returning, this time with our focus set on taking it all. -Ethan N.

## **FLYING ACCOMPLISHMENTS**

- ⇒ **Gull Lake— Chairman,s winners and plced 9th**
  
- ⇒ **Livonia Churchill— Won Engineering Inspiration and district winner**
  
- ⇒ **State Championship— Triple Qualified and place 18th out of 200**
  
- ⇒ **Worlds Championship—placed 17th out of 100**
  
- ⇒ **Michigan Science Center—placed 6th out of 23**
  
- ⇒ **MARC—placed 2 out of 64**
  
- ⇒ **IRI—placed 44 out of 68**



## Fellow Toasters



Christopher T.—I worked on the Vex robot as co captain, made prototypes for blocker mechanism and Frisbee scooper.

My Quote: “In Robotics, working in a group or by yourself isn’t just fun, it’s an experience.” My accomplishments were helping Vex build and drive our robot effectively and making intelligent and humorous friends to work with.



Kerry P.— I worked on the Chairman's Award presentation, executive board. Team image and spirit. My Quote;” Once a toaster spreads its wings, it will never forget how to fly! Helped the team earn the Chairman’s Award at Gull Lake, making 3641 the youngest team to have ever won a district CA to date.



Baylie B.—This year I am finally an official member of the Flying Toasters! For the past three years I have been following around my brother (Lucas B.) from each competition observing what it would be like to be a part of the team. While venturing with the team I have shown my spirit at many competitions, therefore at the end of last season I was graciously awarded the team spirit award. Now that I am part of the team I am looking forward to working my way to many more great achievements and helping my team and our community succeed at many great things.



Connor H.—Scouter/Community Outreach. Quote: “Time makes the best teacher; unfortunately it kills all of its students in the end.” Major Achievement: Scouting at all FIRST events



Jake P.—Shop-hand. Worked on fabrication and mechanical aspects of the robot. I SURVIVED THE YEAR!!! hahaha no. I had a major hand in production of the pits and the team’s practice field. Also mechanical design and machining/fabrication of what parts I was given on the Robot

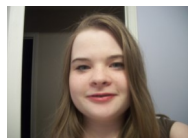


Aaron B.—Quote: “This year has been a fun but busy filled year. But in spite of that I have grown to know my team mates more and it feels like I have a new family.”

Achievement: A big achievement I feel for me this year was being on the drive team at the MARC competition.



Ethan N. —This past year, I was sort of a jack of all trades when it came to building the robot. Being that it was my first year, it was a good experience for me. I was able to help build the chassis, do a bit of wiring and electrical work, and help with pneumatics. It helped me to become fairly knowledgeable about all aspects of a robot. “Lucas B: Bro, do you even robot??” “Ethan N: No I don’t robot....yet” At this past year’s MARC competition, I as the rookie driver along with Aaron got us the second seed position in the elimination rounds.



Amanda P. —Worked on or did: Scouting during competitions and helped advertise the team to various places. Favorite quote: “We’re not done yet.” Major Achievement part of: Built VEX robot and competed in OCCRA, Telling Kerry Pierce to ask if there can be robots in the Michigan Science Center.



Lucas S.—CEO 2013, Chairman’s Team. Quote: “You only live once.” Major Achievement: Chairman’s award, Website, Engineering Inspiration, Chairman’s Pit, a successful season.

## Robotics Banquet

To end our amazing season of robotics we held a banquet. At this banquet we had food ordered in from Aleko's and had people donate food. Everyone had to wear formal clothing and we started with demonstrating our robot. The dinner followed, which consisted of chicken, breadsticks, salad and pasta. Next we had a slideshow displaying how our year went and what we accomplished that year. It started with how the year be-

gan and then how our victory with Chairman's went at Gull Lake. Following that we spoke of our winning of a districts and the Engineering Inspiration award at Churchill Livonia. The ending of the slide presentation spoke of our competing at the Michigan State Championship and the World Championship.

Once the slideshow was complete we thanked each and every one of our sponsors for helping

us get to where we managed to get that year. Then we did the same towards the mentors and boosters, thanking them for all the time they spent assisting the team. After those, we went on to mention the students who were on the team, and what they accomplished. We presented a few of the hard working students with their varsity letter for robotics. And finally we announced our 2013 officers for the student board. - Connor H

**“We went on to mention the students who were on the team, and what they accomplished.”**

### 4th year Veteran

Lucas S.

### 3rd year veteran

Kerry P.  
Scott B.  
Lucas B.  
Jacob P.  
Chaz S.

### 2nd year veteran

Michael B.  
Patrick H.  
Connor H.  
Amanda P.  
Tessa F.  
Elizabeth S.

### 1ST year veteran

Aaron B.  
Luke W.  
Christopher T.  
Ethan N.

### Mentors

James Burkowski  
Ed Debler  
Katie Hyrila  
Adil Siddiqui  
Doug Pierce  
Mike Lepkowski  
Brian Debler  
Joseph Charette

### Boosters

Doug Pierce  
Barbara Brodesser  
Jen Debler  
Diana Humfleet  
Bridget Perion  
Denise & Ken Stodor

## Hardy Elementary

On June 8<sup>th</sup>, the team participated in the annual Salem Flag Day. The South Lyon Robotics team marched in the parade through downtown Salem. Afterwards, the

team demonstrated how the team's robot can shoot Frisbees in the town square. The kids were also fascinated by our toaster that flaps its wings. This is annual

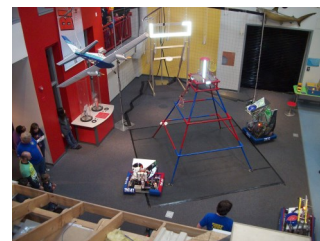
event is a good opportunity to raise awareness of robotics in the local area. In addition, the team raised money through a bake sale.—Amanda P.

## Ann Arbor Hands On Museum

As a team we needed to think of new and creative ways to get people interested in robotics. Our 2012-2013 president at the time Kerry Pierce thought going to a museum would gain lots of attention if we hosted an exhibit while there. As a team, we all pitched in to

take on the challenge of organizing an event. The event gained lots of excitement from both the staff at the museum and the kids going to the museum. We asked other area FIRST teams to participate so kids going to the museum had different robots to watch. All the

teams taught youngsters how to aim their robot to shoot Frisbees into a net. The Ann Arbor Hands-on Museum was one of our favorite events to be a part of since, little kids got to spark an interest into FIRST plus we got to explore the place too. —Amanda P.



## School Board Presentation

This year we were invited to give a demonstration to our school board for the second time. The previous visit, we were a rookie team that just started out and were not completely sure what we were doing, but this year it was different. We brought part

of the field and set it up in the parking lot and gave demonstrations of the robot shooting Frisbees. Then, our Chairman's team gave their presentation which really showed how far we came as a team since the last time. This time we were well

organized and had plenty of accomplishments to be able to share with the board. I was a very good experience, having the opportunity to show them how well the team has grown and also to thank them for supporting us by allowing the team to use the school as our primary meeting space and as a place to design and construct the robot.—Scott B.



## Salem Science Fair

The Flying Toasters attended the Salem Science fair on May 30<sup>th</sup>. The main goal of this event was to help the little kids gain an interest in robotics. After all, kids are a lot easier to fascinate at a younger age. At this event we took the Frisbee shooting robot to the school during their sci-

ence fair. The kids loved it. At first the robot was only shooting at weighted bags, but after a challenge our drivers tried making the disks into a basketball hoop. While this was happening some of the kids were assisting the team and using their energy to help collect the launched Frisbees. At the

end of the day not only did the kids get to show their love for science due to the science fair, but also devolved a like towards robots as well. Who knows? One day some of those kids may join the South Lyon robotics team.

-Connor H



## Michigan Advanced Robotics Competition (MARC)

Marc was quite a different competition compared to the other ones we went to. Looking around the pit area, I saw a many extremely skilled teams. Being only part of only a three year old team, I had my doubts. One of the traditions of the MARC competition is that teams train new drive teams. The veteran drivers get a break while other members of the team compete on the field. For a good amount of the qualifying

matches Aaron and I controlled the robot while we cycled in different loaders. It became evident pretty quick that the small amount of practice that Aaron and I had in class would pay off. I specifically recall a time when we were in line to get on the field, and a team next to us was teaching the controls of the robot to a new person. What scared me even more was that this team was on our alliance, and that this new person

was going to be driving. Still, we were able to win most of our matches. Our little bit of experience in driving got us the second seed for elimination matches. -Ethan Novilla



## Pumpkin Fest

This year, the team raised nearly \$900 at the annual Pumpkinfest, a local South Lyon festival held every year to celebrate the fall season. While providing games for the youth to play, the Flying Toasters use his opportunity to spread the word of FIRST as well as promote the accomplishments and inspire others to become a FLYING TOASTER!



## OUR PARTNERSHIPS

<p><b>Armyproperty.com</b> 2070 Tibbits CT, Ann Arbor, MI 48105 912- 596-2791</p>	<p><b>Yazaki North America, Inc.</b> 6801 Haggerty Road, Canton, MI 48187 <a href="http://www.yazaki-na.com/">http://www.yazaki-na.com/</a></p>
<p><b>New Hudson Discount Pharmacy</b> 56270 Grand River, New Hudson, MI 48165 248-486-0720</p>	<p><b>Busch's</b> 22385 Pontiac Trail, South Lyon, MI 48178 248-446-8812</p>
<p><b>New Hudson McDonalds</b> 30528 Lyon Center Dr., New Hudson, MI 48165 <a href="http://www.mcdonalds.com">www.mcdonalds.com</a> 248-446-8169</p>	<p><b>Artistic Permanent Cosmetics</b> 1257 Main St., Plymouth, MI 48170</p>
<p><b>Swain Media LLC</b> Senior Pictures, Photographer 313-355-2513</p>	<p><b>TNT Orthodontics</b> 21800 Pontiac Trail Suite 200, South Lyon, MI 48178 Phone: (248)-446-6000</p>
<p><b>Martin's Hardware</b> 22970 Pontiac Trail, South Lyon, MI 48178 248-437-0600</p>	<p><b>Holcim US Inc.</b> 6211 North Ann Arbor Rd., Dundee, MI 48131 (734) 529-2411 <a href="http://www.holcim.us/">http://www.holcim.us/</a></p>
<p><b>South Lyon Fence Co.</b> 53583 Grand River Ave., New Hudson, MI 48165 Phone Number: (248)437-4445</p>	<p><b>RIW Hobbies</b> 29116 5 Mile Rd., Livonia, MI 48154 734-261-7233</p>
<p><b>South Lyon Orthodontics</b> 22900 Pontiac Trail, South Lyon, MI 48178 Phone: (248)-437-1620</p>	<p><b>Parts Plus</b> 381 Reese St., South Lyon, MI 48178 248-486-9404</p>
<p><b>Miners Barber Shop</b> 56875 Grand River Ave., New Hudson, MI 48165 Phone Number: (248) 486-3270</p>	<p><b>Joel's on Joy—Transmission rebuilding</b> 20901 Joy Rd., Detroit, MI 48228 248-446-6024</p>
<p><b>Cybernet Systems Corporation</b> 3885 Research Park Drive, Ann Arbor, MI 48108-2217</p>	

## OUR 2013 FIRST SEASON PARTNERSHIPS

Andymark, Anonymous, Artistic , Permanent Make-up, Bastien Enterprises LLC, Borg Art & Landscape Design, Brodesser Family, Brostrom Physical Therapy, Bud Martin’s Hardware, Burkowski Family, Busch’s, Carol and Paul Paquette, Cash Sod Farm, Caterina Hernandez, Chuck and Terri Settino, Cybernet, Dandy Acres, Debler Family, Edward and Kathleen Debler, Farmington Distribution Center, Filter Technologies, Jahn Hakes, Johnson Family, KTC Inc, Kurtis & Felhander PC, Marlene Archambeau, Miners Barber Shop, MST-Michigan Seamless Tube, Norma and Donald Heller, Novilla Family, Oxford Hyperbaric Oxygen, Peters True-Value Hardware, Pierce Family, Perion Family, RIW Hobbies, Rosalyn Santos, S L Gower, SAIC, Schroder & Schroder, Solidworks, South Lyon Family Docs, South Lyon Orthodontists, Superb Fabrication LLC, Swain Media LLC, Talbert Family, TNT Orthodontists, Tooth Town Pediatric Dentistry, TSC-Tractor Supply Co, TRW Automotive, Walkers Service, Wiseman Family, Yazaki Inc.



# Important 2014 FIRST Season Dates

<b>*TEAM 3641 Season Kickoff</b>	SLEHS Room 2413	South Lyon	Oct 17; 7PM
<b>*FIRST KICKOFF (Game release)</b>	Novi High School	Novi	Jan 4
<b>*Robot Bag &amp; Tag</b>	SLEHS Room 2413	South Lyon	Feb 18
Center Line-District Competition	Center Line High School	Center Line	Feb 28-Mar 1
Southfield-District Competition	Southfield High School	Southfield	Feb 28-Mar 1
Kettering University-District Competition	Kettering University	Flint	Mar 7-8
Gull Lake-District Competition	Gull Lake High School	Richland	Mar 7-8
<b>*Howell FIRST Robotics District Competition</b>	Parker Middle School	Howell	Mar 14-15
Escanaba-District Competition	Escanaba High School	Escanaba	Mar 14-15
Traverse City-District Competition	Traverse City Central High School	Traverse City	Mar 21-22
West Michigan-District Competition	Grand Valley State University	Allendale	Mar 21-22
<b>*Livonia FIRST Robotics District Competition</b>	Churchill High School	Livonia	Mar 28-29
St. Joseph-District Competition	St. Joseph High School	St. Joseph	Mar 28-29
Troy-District Competition	Troy Athens High School	Troy	Apr 4-5
Bedford-District Competition	Bedford High School	Temperance	Apr 4-5
<b>*Michigan FRC State Championship</b>	Eastern Michigan University	Ypsilanti	Apr 10-12
<b>*World Championships</b>	Edwards Jones Dome	St Louis, MO	Apr 23-26
<b>*Team Banquet</b>	SLEHS Commons	South Lyon	May 15; 6PM

# NOV 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					01	02
03	04	05	06	07	08	09—VEX Competition
10	11	12	13	14	15	16- Bloom- field Girls Robotics
17	18	19	20	21	22	23
24/31	25	26	27 No school	28 Thanks- Giving	29 No school	30

## Schedule of Events

- November 9th: VEX competition.
- November 16th: Bloomfield Girls Robotics Competition
- January 4th: FRIST Kick-Off @ Novi HS.



### SOUTH LYON ROBOTICS

**Address:**

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52200 W Ten Mile Rd  
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**Phone/Email:**

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